Application No.: A.19-04-___
Exhibit No.: SCE-01
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FILED
04/22/19
04:59 PM

A1904014

SOUTHERN CALIFORNIA EDISON®

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(U 338-E)

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020 and to Reset the Annual Cost of Capital Adjustment Mechanism

Before the

Public Utilities Commission of the State of California

Rosemead, California
April 22, 2019

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020

Table Of Contents

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020

Table Of Contents (Continued)

Table Of Contents (Continued)

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020

Table Of Contents (Continued)

Table Of Contents (Continued)

Table Of Contents (Continued)

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020

List Of Figures

Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020

List Of Figures (Continued)

Figure	Page

I.

EXECUTIVE SUMMARY

Southern California Edison Company ("SCE") hereby submits its April 2019 cost of capital application for test year beginning January 1, 2020. The purpose of this proceeding is to authorize a cost of capital that fairly and justly compensates investors and allows SCE to attract capital to meet its obligations to serve its customers safely and reliably.

SCE's credit quality and its cost of capital are shaped by the unique, ongoing risks it faces. By far, the dominant risk that SCE faces at this time is the risk of wildfires. California's wildfire risk has dramatically increased, resulting in a "new abnormal" of year-round and potentially catastrophic wildfires. The State's investment risk profile has deteriorated substantially due to recent catastrophic wildfires, combined with the application of inverse condemnation with a strict liability standard, and the Commission's unclear and prolonged cost recovery process. SCE has reflected probable liability of $4.7 billion dollars related to wildfires and related events in its service territory in 2017 and 2018 and has reported this to be a lower end of the estimated range amount.[1] Compared with non-California investor-owned utility peers, SCE's credit rankings for business, financial and regulatory risk have dropped significantly since the last Cost of Capital case; SCE ranks low compared to utilities outside of California and faces business risk levels on par with historically riskier non-utility companies. SCE's credit ratings for long-term debt have been downgraded, placing SCE precipitously close to falling below investment grade status, while its preferred equity is no longer investment grade rated. SCE has already experienced increases in long-term debt issuance costs. SCE's investors require a higher return on common equity to compensate for this unique and asymmetric risk until such time as the wildfire cost recovery framework is fixed.

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[1] *EIX and SCE 2018 Annual Report on Form 10-K,* as required by the U.S. Securities and Exchange Commission ("SEC"), which includes financial statements covering the period Jan 1, 2018 – Dec 31, 2018, p. 104, available at https://www.edison.com/home/investors/sec-filings-financials/quarterly-earnings-reports.html, link entitled "Q4 10-k (PDF)". Charge of $2.5 billion ($1.8 billion after-tax) in 2018 for SCE's wildfire-related claims, net of expected recoveries from insurance and FERC customers.

Even aside from wildfire risk, investors demand a higher return on common equity for investing in utilities in California. California is leading an industry transformation towards a clean energy future. SCE is committed to this future, cleaning the grid through renewable energy, storage, and energy efficiency programs and then using that cleaner grid to improve the transportation sector and building performance through electrification. This transformation comes with challenges associated with planning, designing and operating a grid that can safely and reliably support these objectives. SCE is also undertaking capital investments to accommodate these new technologies as well as to mitigate wildfire risks. This requires a strong credit rating to attract capital needed to support these investments. SCE also faces risks related to California's evolving approach to energy procurement and electric retail competition and a trend towards greater regulatory uncertainty and lag.

In this proceeding, consistent with law and SCE's financial condition, the California Public Utilities Commission ("Commission" or "CPUC") should authorize a return on rate base of 10.96% based on a capital structure reflecting 52% common equity, 5% preferred equity and 43% debt. This return on rate base includes a base ROE to compensate investors for generally-higher risks associated with operating a utility in California, which would be subject to the adjustment mechanism currently in effect based on interest rate fluctuations.

SCE also requires a separate ROE to compensate investors for significant and asymmetric wildfire risk, which SCE would seek to reduce or remove as soon as its wildfire cost recovery and liquidity risks materially change due to legislative or regulatory actions. This additional ROE should be an interim measure until the State legislature and this Commission take substantial steps to mitigate wildfire cost recovery risk, for example, by establishing a clear, durable, and repeatable process for assessing the prudency of California investor-owned utility ("IOU") wildfire operations that enables timely cost recovery of prudently-incurred, wildfire-related expenses. Long-term, customer affordability and policy objectives are best served by a durable cost recovery framework rather than through ROE.

Until a durable framework or other adequate legislative or regulatory fix is put in place, investors will need to receive an ROE commensurate with the higher risk associated with investing in a California IOU. SCE recognizes that without this, investors can and will choose instead to invest in less-risky

utilities outside of California. SCE's proposed returns on debt, preferred and common equity aim to compensate investors for the increased risks that SCE faces compared to other U.S. utilities. The Commission's decision in this proceeding will be an important signal to investors and the investment community that the Commission supports SCE's efforts to maintain its investment grade credit rating and is committed to making the regulatory decisions necessary to achieve that goal. SCE's customers are the ultimate beneficiaries of SCE's capital investment and policy implementation. Adopting SCE's recommended cost of capital, ratemaking capital structure, and adjustment mechanism will improve SCE's financial health and resiliency and ensure access to capital under a variety of market conditions. Each of these features is necessary for SCE to meet its public utility service obligations safely and reliably as well as fully support California's public policy initiatives.

II.

SCE'S 2020 COST OF CAPITAL RECOMMENDATION

A. Summary of SCE's Request

This testimony supports SCE's request for a 2020 cost of capital and capital structure to be applied to all of SCE's utility assets subject to this Commission's jurisdiction. Specifically, SCE requests the following:

- Increasing its non-wildfire related ROE ("Base ROE") to 10.60% percent and including an additional ROE for wildfire risk ("Wildfire Risk ROE") of 6.00% that SCE would seek to modify or remove upon a material change in SCE's wildfire cost recovery and liquidity risks due to mitigating regulatory or legislative changes;
- Increasing its authorized common equity ratio from 48% to 52%[2] while reducing its preferred equity ratio from 9% to 5% in its capital structure;
- Setting its authorized embedded costs of long-term debt to 4.74% and preferred equity to 5.70%; and

[2] SCE's Base ROE request is based on the Commission adopting this increase in SCE's authorized common equity to 52%. Should the Commission reject SCE's requested common equity increase, SCE's ROE would need to be increased to 10.9%. *See* Exhibit SCE-02, pp. 5, 66.

- Maintaining SCE's current Cost of Capital Mechanism ("CCM") for Base ROE, embedded costs of long-term debt and preferred equity, but not Wildfire Risk ROE.

These authorized cost of capital components will result in an overall return on rate base of 10.96%. A rate increase for SCE's customers is estimated at $1,226 million in 2020, assuming SCE's pending 2018 GRC application is adopted, including the proposed post-test year ratemaking mechanism. This change in cost of capital will increase SCE's system average rate by 1.76 cents/kWh. A summary of SCE's request is shown in Figure II-1 and the revenue impacts associated with SCE's request are shown in Figure II-2.

Figure II-1
2020 Recommended Cost of Capital for SCE

Component	Percentage	Cost	Weighted Cost
Long-Term Debt	43.0%	4.74%	2.04%
Preferred Equity	5.0%	5.70%	0.29%
Common Equity	52.0%	10.60% (Base) 6.00% (Wildfire Risk)	8.63%
Total	**100.0%**		**10.96%**

Figure II-2
Revenue Impact Based on Proposed 2018 GRC – Bundled Revenue

Impact Associated With:	Bundled Revenue Increase
Base ROE, Capital Structure and Embedded Cost	$93 million
Wildfire Risk ROE	$1,133 million
Total	**$1,226 million**

B. Supreme Court Principles Regarding Utility Return

The Commission's decision authorizing the company's rate of return is crucial to assuring continued capital attraction and quality service for SCE's customers. Of utmost importance to establishing SCE's cost of capital are the four fundamental principles established in two longstanding

decisions of the U. S. Supreme Court commonly referred to as "*Bluefield*," and "*Hope*."[3] They are described in *Bluefield* as follows:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures [*comparability standard*]. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility [*financial soundness standard*] and should be adequate, under efficient and economical management, to maintain and support its credit [*creditworthiness standard*] and enable it to raise the money necessary for the proper discharge of its public duties [*capital attraction standard*].[4]

These four principles can be summarized as:

- The return must be comparable to returns on investments of similar risk;
- It must be sufficient to ensure confidence in the financial soundness of the utility;
- The return should maintain the utility's credit; and
- It must allow the utility to attract the capital necessary to provide proper service to customers.

By applying these principles, the Commission will strike a lawful and appropriate balance between reasonable investor returns and the lowest possible rates to customers. Furthermore, by properly maintaining this balance, the Commission can foster continued confidence in SCE's financial integrity and minimize SCE's long-term borrowing costs. Providing this opportunity to earn a return on investment consistent with these principles is necessary to reflect the risks in the business although ultimately, SCE must apply prudent management and decision-making in order to actually earn the authorized return.

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[3] *Bluefield Waterworks & Improvement Co. v. Public Service Commission of West Virginia et al.* ("*Bluefield*," 262 U.S. 679, 43 S.Ct. 675 (1923)), and *Federal Power Commission et al. v. Hope Natural Gas Co.* ("*Hope*," 320 U.S. 591, 64 S.Ct. 281 (1944)).

[4] *Bluefield, 262 U.S. 679, 692-693; 43 S.Ct. 675, 679 (1923).* These principles are also described in *Hope*. *Hope, 320 U.S. 591, 603; 64 S.Ct. 281, 288 (1944).*

The comparable-returns principle recognizes that investors have a variety of investment opportunities. In the long run, regulators authorizing below-market returns will drive away investors. Authorizing returns that are comparable to those earned on alternate investments on a risk-adjusted basis is the only real way to attract capital. Otherwise, investors will withdraw capital and invest in alternative assets that properly reward risk. In such a situation, the utility may not be able to retain or raise the significant capital funds it requires for investment.

This Commission has recognized the importance of financially healthy utilities. In its decision approving settlement agreement that allowed PG&E to exit bankruptcy in 2003, the Commission stated:

> In setting just and reasonable rates, in addition to protecting the consumers, we also must consider the financial health of the public utility. Indeed, we view this commitment to act to facilitate and maintain investment grade credit ratings as essentially doing what we have always done under cost-of-service regulation: provide just and reasonable rates and authorize a reasonable capital structure that maintains the fiscal integrity of the utility.[5]

Ultimately, without a fair market return the utility cannot invest in new equipment to serve its customers, nor can it borrow to finance capital expenditures or secure power purchase agreements at a reasonable cost. Any short-term benefits to customers from below-market authorized returns will be eroded by higher costs for borrowing or lower-quality service.

C. SCE's Base ROE and Wildfire Risk ROE Requests

SCE seeks a Base ROE of 10.60% to provide this comparable return to investors (without accounting for wildfire risks). SCE's Base ROE is supported by the testimony of Dr. Bente Villadsen, of the Brattle Group (*Testimony on SCE's Base ROE*), who relies on predictive modeling to establish a reasonable Base ROE range based on a proxy group of utilities and then places SCE at the high end of that range based on unique risks that SCE and other California IOUs face. As Dr. Stern testifies, in Section III herein, SCE is embarking on an unprecedented capital investment program, driven by the need to protect against wildfires, achieve ambitious state environmental policies, and replace aging infrastructure. The sheer magnitude of SCE's capital investment program as compared to its asset base

[5] D.03-12-035, pp. 32-33 (internal citation omitted).

means that SCE will require more external financing than it has in the past and more than required by its industry peers. SCE requires strong credit ratings to have low-cost access to these capital markets.

Because SCE's equity risks related to wildfires are not comparable to those of non-California electric utilities and cannot be assessed through conventional methods, SCE engaged the Brattle Group's Frank Graves (*SCE-03, Testimony on Asymmetric Wildfire Risk*) to determine the ROE needed to compensate investors for this significant and unique-to-California risk. Mr. Graves relied upon a combination of SCE's expected loss forecast data and external information on costs of obtaining insurance to calculate SCE's annual expected loss due to wildfires above the normal insurance level of $1.0 billion. Based on this report, SCE seeks an additional 6% ROE to attract equity capital in the face of increased wildfire risk. SCE explains its rationale for selecting this level in Section IV.F.

SCE is bifurcating its Base ROE request from its Wildfire Risk ROE for several reasons. First, as discussed, predictive models used for the Base ROE do not adequately account for or reflect SCE's unique risks related to recent catastrophic wildfires in California. Second, although SCE needs a Wildfire Risk ROE to adequately cover its wildfire risks, the use of ROE to cover such risks is not an appropriate long-term solution. It is difficult to estimate the necessary additional ROE needed to offset the potential costs investors may face for wildfire losses. Moreover, a wildfire ROE may create the wrong impression that SCE is fully protected and can withstand any level of wildfire damages – it cannot. While an increased ROE may encourage continued investment in SCE despite wildfire risks, it does not ensure nor is it intended to ensure SCE has the financial wherewithal to absorb all magnitudes of wildfire liability. In the coming months, SCE will continue to advocate for comprehensive legislative and regulatory action to address wildfire cost recovery issues. The Wildfire Risk ROE is an interim measure to promote utility financial health, adequate capital attraction, and safe operations, while a long-term solution is being worked out.

D. Capital Structure Recommendation

As detailed in Section V, SCE proposes to reduce its authorized level of preferred equity from 9% to 5% of total capitalization in the 2020 test year. This change is needed to move SCE towards the levels of preferred equity typical of other IOUs in California and nationwide. This also makes sense

given the amount of preferred equity used by U.S. IOUs is small and the market accessible to SCE, upon its downgrade below investment-grade levels, is reduced in size. SCE also seeks to raise its common equity ratio from 48% to 52% in order to improve the credit metrics used by the credit rating agencies to assess SCE's financial health. This will lower SCE's financial risk as a rational response to SCE's higher business risk. At the very least, the capital structure changes will help prevent further declines in SCE's rating in the event of financial stress.

E. Changes to Cost of Capital Mechanism

As detailed in Section VII, the CCM was initially adopted in D.08-05-035 to reduce the frequency of filings of cost of capital applications to every three years. The CCM allows the utility's authorized cost of capital to adjust based on significant fluctuations in interest rates during non-test years. The CCM is an effective tool for ensuring that the ROE remains reasonable, even in the face of significant interest rate fluctuations. SCE proposes that the CCM be maintained for purposes of the Base ROE, embedded cost of long-term debt and preferred equity.

Given the state of flux of SCE's wildfire risk and because SCE does not believe that wildfire risk changes with interest rates, the CCM should not be applied to the Wildfire Risk ROE. The Wildfire Risk ROE would be subject to change upon SCE filing a new application, should SCE's wildfire cost recovery and liquidity risks materially change due to legislative or regulatory actions. If the Commission wants SCE to file an application to update the Wildfire Risk ROE, SCE requests a minimum of 90 days to fulfill such a request.

III.
BASE ROE

A. Predictive Models Support SCE's Base ROE Request

SCE engaged Bente Villadsen, a Principal of The Brattle Group, to run several predictive models, namely Discounted Cash Flow ("DCF"), empirical/Capital Asset Pricing Model ("CAPM/eCAPM"), as well as an implied risk premium analysis ("Risk Premium"), to determine a reasonable Base ROE for SCE. To compensate investors for these risks, Dr. Villadsen recommends a

Base ROE of 10.6%,[6] which is the high end of the range of average results (from 9.7 percent to 10.6 percent) from the predictive models using a sample of regulated electric utilities as well as a sample of water and natural gas utilities. 10.6% is also the upper bound for the electric utility proxy group. This analysis is described in Exhibit SCE-02 (*Testimony on SCE's Base ROE*). In Section B, SCE describes the main factors contributing to a Base ROE for SCE that is at the high end of the range of what is reasonable, due to risks unique to California IOUs and SCE, specifically.

B. SCE's Capital Investment Commitments Require a Higher ROE

1. Transformation of the Electric Grid and Associated Risks

California is a leader in addressing climate change and air pollution, with the legislature and this Commission spearheading an industry transformation towards a clean energy future. SCE is committed to this clean energy future, through use of renewable energy, storage mandates, and energy efficiency programs and using that cleaner grid to improve the transportation sector and building performance through electrification.[7] However, to achieve the state's aggressive environmental policy objectives, SCE faces a significant level of cost recovery risk associated with designing and operating a grid that can safely and reliably support these objectives. Particular challenges arise out of California's aggressive Renewables Portfolio Standard ("RPS") and other clean energy goals, the proliferation of Distributed Energy Resources ("DERs") such as rooftop solar, energy storage, and transportation electrification. At the same time, SCE has been taking aggressive action to harden infrastructure, improve situational awareness and enhance operational measures to further reduce the threat of wildfire ignitions involving utility electric systems and improve grid resiliency. SCE's substantial investments in its grid are necessary to address climate change while also supporting California's climate adaptation

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6 *See supra,* n. 2.

7 *See* SCE, *The Clean Power and Electrification Pathway* (November 2017), available at: https://www.edison.com/content/dam/eix/documents/our-perspective/g17-pathway-to-2030-white-paper.pdf

efforts, including actions to address the increased wildfire threat.[8] While SCE has a long history of meeting and overcoming these challenges, and we believe we can manage them effectively, the increased risks they impose on us persist, and should be recognized.

a) Renewables Portfolio Standard

California has one of the most aggressive RPSs in the nation.[9] When originally passed in 2011, the RPS required electric utilities to procure 33 percent of their electricity from renewable energy sources by 2020. Senate Bill 350 was passed in 2015 and established a goal of 50 percent by 2030. Then in 2018, Governor Brown modified this to a requirement of at least 60% by 2030 and a 100% carbon-free electricity goal for the State by 2045.[10]

The growth of renewable energy as a proportionate share of SCE's power mix is changing the timing and nature of load peaks on SCE's system. These goals place SCE at the very forefront of dramatic and untested industry change. Notably, while the goals and requirements have been set, there currently is no clear plan or path on how these transformational reforms will unfold in order to realize the desired end results. Moreover, there is great uncertainty on how to reach these goals while preserving safety, affordability and maintaining the financial health of the utilities dramatically impacted by this transformation, including SCE. In the meantime, SCE faces significant risks during this transformation and will likely face significant challenges for years to come.

For example, California utilities will need to address the grid reliability and operational challenges associated with this dramatic and rapid change in moving towards a resource mix of new technologies like inverter-based generation and energy storage. This includes intermittency issues related to renewable and distributed generation as well as how to handle excess generation during times when generation exceeds load, and challenging ramping issues often represented by the now

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8 *Wildfires and Climate Change: California's Energy Future: A Report from Governor Newsom's Strike Force,* p. 17-25 (April 12, 2019) (acknowledging the connection between many of these programs and wildfire risk mitigation).

9 Megan Cleveland, *States' Renewable Energy Ambitions* (February 4, 2019) available at: http://www.ncsl.org/research/energy/states-renewable-energy-ambitions.aspx

10 *See* California Renewables Portfolio Standard (RPS), available at: http://cpuc.ca.gov/rps/.

widely known "duck curve." The growth of renewable energy as a proportionate share of SCE's power mix is also changing the timing and nature of load peaks on SCE's system and SCE must change the way it plans its system. These issues create operational risks and challenges for grid design.

The pace of technology change and transition to more renewable and distributed generation, including storage, creates risk for SCE's transmission and associated distribution investments. One recent example is SCE's Alberhill substation. In 2009, SCE proposed building the Alberhill substation, which includes both FERC and CPUC jurisdictional assets, in order to resolve overloading on SCE's distribution system and to address load growth in the area. Almost 10 years later, on April 4, 2018, the CPUC issued a proposed decision denying the Alberhill Certificate of Public Convenience and Necessity based on the CPUC's conclusion that the project is not needed by 2021, if at all. The CPUC based its conclusion on recent successive forecasts from SCE and California Independent System Operator Corporation ("CAISO"), predicting decreasing rates of load growth than the forecasted rates SCE and CAISO had initially relied upon. Additionally, the CPUC concluded that with future battery storage potential "…there is no reason to expect anything other than a downward impact on peak demand."[11] In August 2018, the CPUC approved a revised alternate decision holding the Alberhill System Project proceeding open and directed SCE to submit supplemental information on the Alberhill System Project including details of demand and load forecasts and possible alternatives to the proposed project.[12] SCE continues to believe the Alberhill System Project is needed, but is unable to predict the timing of a final CPUC decision in connection with the Alberhill System Project. SCE's ability to recover costs of this project, if abandoned, is uncertain. If SCE is required to write off this project, we could incur a pre-tax charge of $31 million. Ongoing capital spending has been deferred as a result of the CPUC request for additional information and alternatives.

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[11] A.07-01-031, *Proposed Decision Granting Petition To Modify Permit To Construct The Valley-Ivyglen 115 Kv Subtransmission Line Project And Denying Application For Certificate Of Public Convenience And Necessity For The Alberhill System Project,* p. 32-33 (April 4, 2018).

[12] D.18-08-026, *Decision Granting Petition to Modify Permit to Construct the Valley-Ivyglen 115 kV Substransmission Line Project and Holding Proceeding Open for Certificate of Public Convenience and Necessity for the Alberhill System Project* (August 23, 2018).

In general, the rate of technology advancement is exponential, making it difficult to forecast impacts on load growth as well as the future role of the transmission and distribution projects that are in development, which complicates future transmission and distribution planning. As a result of rapid changes, a project that is deemed necessary today may be revisited before it can go into service. As the CAISO works to get to 100% renewables and electrification of buildings and transportation is pursued in earnest, there will likely be uncertainty regarding whether transmission is needed or whether distribution and storage are sufficient. With those shifts come risks, including those impacting SCE's traditional system planning, its ability to meet customer load and its role in this industry transformation. Such risks, as well as risks relating to the postponement or cancellation of projects, increase uncertainty for investors.

b) DERs, DRP and Grid Modernization

California, as led by this Commission, is also aggressively promoting the widespread deployment of DERs – such as rooftop solar panels, energy storage, and other energy management systems – and the innovative use of these resources to provide services and benefits to the grid. DER growth creates many new opportunities for grid operators to manage power flows on the grid. For example, DERs can mitigate the risk of an outage during hot summer days when SCE's system is running at peak capacity.

The growth of DERs also comes with operational risks. The current grid lacks the capability to accommodate large amounts of two-way power flows or effectively utilize DERs to their full potential. SCE's distribution system has historically been structured to accommodate power flows running in one direction – from central station generation to the end-use customer. The grid envisioned by the Distribution Resources Plan proceeding ("DRP"),[13] the Integrated Distributed Energy Resources

[13] R.14-08-013, *Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769,* (August 14, 2014) (focused on integration of distributed energy resources, enabling customer choice of new technologies and services that reduce emissions and improve reliability, and providing a greater role for DERs to provide grid services).

("IDER")[14] and other state and federal policies requires a paradigm shift, whereby customers have a wide-range of technology options for meeting their energy needs, generation can be optimized no matter where it is on a distribution circuit, and power can flow in either direction without hindering reliability or the safety of customers, utility workers, or the public. SCE's distribution grid is aging and is facing new strains in the form of outdated and slow telecommunications systems and technology obsolescence. SCE is also uniquely vulnerable to increasing cybersecurity risks due to greater numbers of distribution-connected devices and the specific technology required to manage the new grid architecture needed to accommodate DERs. At the same time, customers are coming to expect more reliability – as their reliance on new technology grows, they have less tolerance of outages, security breaches, and communications issues than ever before. As an experienced grid operator, SCE will manage these risks; nonetheless these operational risks distinguish SCE from other utilities and drive a higher Base ROE.

SCE's ambitious grid modernization program seeks to leverage new communications technology, automation, and information systems for monitoring control and increased cybersecurity. SCE intends to modernize its urban system in order to achieve California's aggressive decarbonization objectives. In proposing this grid transformation, SCE is out in front of California utilities and utilities nationally. While SCE believes its grid modernization program is squarely in-line with the Commission's own vision and is critical to achieving the Commission's clean energy policy objectives, SCE's position in front comes with risks, including implementation risks that always attend implementation of new technologies and execution of a program system-wide.

An impact associated with the rapid growth of DERs is the potential for distribution investments by the utility to be displaced with new DERs under contracts, as is happening currently in the IDER proceeding, or potentially through tariffs in the future. The ability of DERs to provide the services needed to maintain distribution grid reliability exists, but is in its nascent stages and is still mostly untested, leading to increased risks associated with the contracts, DER performance, and

14 R.14-10-003, D.16-12-036, *Decision Addressing Competitive Solicitation Framework and Utility Regulatory Incentive Pilot* (October 2, 2014) (approving a competitive solicitation framework and a utility regulatory incentive mechanism pilot which will facilitate on a pilot basis the deployment of DERs to displace or defer the need for capital expenditures on traditional distribution infrastructure).

the potential for increased costs if either the services contracted don't deliver all that is expected, or the costs of providing those services turn out to be higher than the alternatives.

Another major risk SCE faces is that it will not be able to recover the costs of its grid investments, especially in light of the fact that *well into 2019*, it has not received a final determination from the CPUC that it should go forward with its *2018 test year* GRC proposals at the level and pace requested. As discussed in Section E.2 below, this regulatory lag of nearly half the rate case cycle creates uncertainty and costs for SCE.

c) Transportation Electrification

SCE has also been actively engaged in promoting electric vehicle adoption and developing needed electric vehicle charging station infrastructure throughout its service territory through its Charge Ready programs. In 2018, SCE filed an application to expand its Charge Ready pilot program, to install infrastructure and provide rebates to support 48,000 new light-duty electric vehicle charging ports as part of a four-year, $760 million ($561 million capital) program, which will also include marketing, education, and outreach.

In January 2017, SCE filed an application with the CPUC requesting approval of programs to accelerate the adoption of electric transportation, which is critical to California's climate change and greenhouse gas reduction objectives.[15] The application proposed a five-year program to fund medium and heavy-duty vehicle charging infrastructure that follows the model developed for SCE's Charge Ready program, as well as six pilot projects to be considered on an accelerated basis. In January 2018, the CPUC issued a final decision approving five pilot projects with a budget of $16 million ($10 million capital) in 2016 dollars. In May 2018, the CPUC issued a final decision approving the five-year program, with certain modifications, to install charging infrastructure to support the electrification of 8,490 medium- and heavy-duty electric vehicles at 870 sites, which must be fully contracted for by

[15] A.17-01-021, *Application Of Southern California Edison Company for Approval of its 2017 Transportation Electrification Proposals,* (January 20, 2017).

2024. The final decision includes an approved five-year budget of $356 million ($242 million capital) in nominal dollars.[16]

SCE has taken an aggressive position in promoting electric vehicles, one that SCE believes is imperative to meet the state's environmental goals, but it is not without risks. SCE is committed to electric transportation as the primary technology to replace fossil-fuel powered vehicles. This transformation will require customer confidence in their vehicles' range, access to quick and reasonably priced charging, and reliable, safe vehicle performance. Adding to the uncertainty is the current federal administration, which has reversed progressive environmental policies and has threatened to impose restrictions on California's ability to regulate clean air and transportation. Working to achieve these goals in an era of potential policy changes creates uncertainty in the planning space.

2. Wildfire Investment

SCE is also pursuing enhanced measures to further address wildfire safety. In September of 2018, SCE launched its Grid Safety and Resiliency Program ("GSRP"), which includes a portfolio of new programs and mitigation measures primarily focused on preventing wildfire ignitions associated with electrical distribution infrastructure in high-fire-risk areas.[17] Some GSRP programs will be completed in 2019, but others, such as the full deployment of covered conductor in high-fire-risk areas, will take several years to complete.

Beyond this, SCE is planning on accelerating and expanding its wildfire mitigation activities in 2019 as part of its Wildfire Mitigation Plan ("WMP"), filed with this Commission pursuant to SB 901, and anticipates incurring additional incremental costs as part of this effort. In its WMP, SCE indicated its plan to spend almost $600 million during the 2018-2020 period on this effort.[18] This WMP

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[16] A.17-01-021, D.18-05-040, *Decision On The Transportation Electrification Standard Review Projects,* p. 118 (May 31, 2018).

[17] A.18-09-002, *Application Of Southern California Edison Company For Approval Of Its Grid Safety And Resiliency Program* (September 10, 2018).

[18] R.18-10-007, *Southern California Edison Company's 2019 Wildfire Mitigation Plan,* p. 97 (February 6, 2019).

includes, but is not limited to, the programs and mitigation measures in the GSRP. The WMP will further harden infrastructure, bolster situational awareness capabilities, enhance operational practices and harness the power of data and technology. Governor Newsom's Strike Force recently acknowledged the importance of such investments to address wildfire risk.[19] Key to funding these and other objectives is SCE's ability to attract low-cost capital from equity and debt investors.

3. Aging Infrastructure

Many of SCE's distribution and lower voltage transmission facilities were installed during the high growth period subsequent to World War II. These facilities are now reaching the end of their useful life, and SCE expects that without major new investments to replace this aging infrastructure, failure rates will increase. In order to mitigate this risk, SCE is engaged in a significant and ongoing infrastructure investment program. Replacing aging infrastructure is necessary but risky, particularly when the requirements that the electric system must meet are changing.

This substantial investment program elevates operating risks. SCE's inherent operating risks include such factors as the risks of human performance, workforce capabilities, public opposition to infrastructure projects, delays, environmental mitigation costs, difficulty in estimating costs or in recovering costs that are above original estimates, system limitations and degradation, and interruptions in necessary supplies. At the same time, the Commission has increased its focus on public safety and compliance with operating and construction standards. Such penalties and liabilities could be significant, but are very difficult to predict or avoid without substantial additional investments in infrastructure.

SCE's remaining generating plants are aging alongside its distribution system. SCE has made investments to extend the lives and relicense its hydroelectric and remaining nuclear units at Palo Verde Nuclear Generation Station based on the expectation that these plants will continue to provide cost-effective, greenhouse-gas-free power. However, in addition to the risks above, continued operation is subject to changing environmental and other regulatory requirements that can change in response to events in other areas over which SCE has no control.

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[19] *Governor Newsom's Strike Force Report, supra,* n. 8 p. 2.

4. Impact of Capital Investment Growth on ROE

As shown in Figure III-3, SCE's capital investment program has vastly increased in order to accommodate system needs and public policy goals. In the last three years, SCE has invested over $10 billion in capital projects and SCE forecasts investing $12 billion more in 2019 to 2021. These levels are unprecedented compared to our historical levels, as Figure III-3 shows.

Figure III-3
SCE Capital Expenditures, 2012-2020

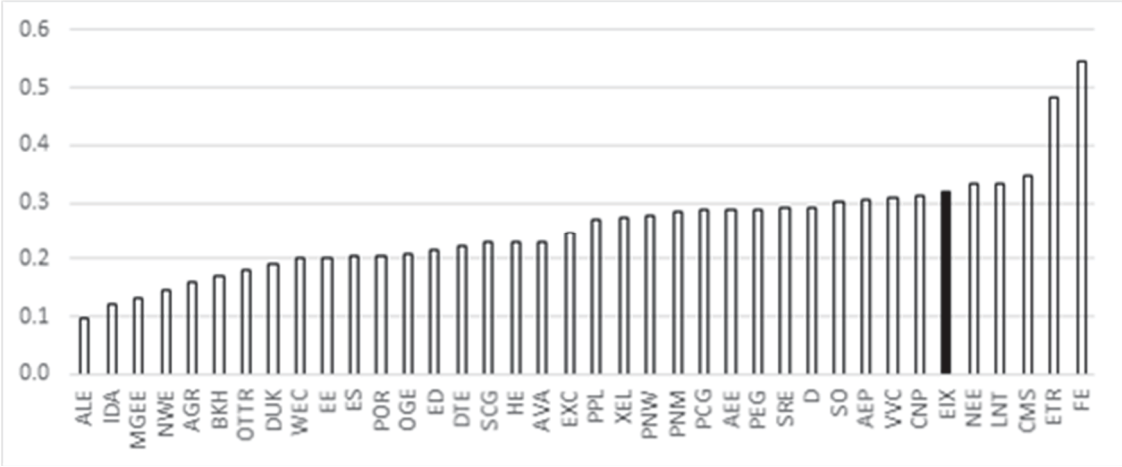
Year	Capital Expenditures ($ Millions)
2012	4,149
2013	3,530
2014	3,967
2015	3,867
2016	3,527
2017	3,835
2018	4,363
2019 (projected)	4,477
2020 (projected)	4,692

These investments require SCE to raise large amounts of capital from both external and internal sources. Over the 2019-2021 period, SCE will need to issue billions of dollars in debt and to reinvest the vast proportion of its retained earnings received through depreciation. In order to justify the reinvestment and to raise the equity capital that may be required to finance such a large investment, SCE must be able to provide a compensatory return to its investors, which can only happen if the Commission authorizes a compensatory authorized cost of capital, particularly a compensatory rate of return for SCE. The sheer magnitude of SCE's capital investment program as compared to its asset base, means that SCE will require more external financing than in the past and more than industry peers.

Due to the magnitude of SCE's recent and planned capital investment, SCE must rely on external financing to a greater extent than utilities with lower capital expenditures. The ratio of capital spending to total book value of its existing assets is indicative of the level of external financing required:

the higher the ratio, the more external financing. As shown in Figure III-4, SCE has one of the highest ratios among the 38 Value Line electric utilities.[20]

Figure III-4
Ratio of Capital Spending to Total Book Value, SCE and Value Line Electric Utilities (2018 est.)



The ratio indicates that SCE needs to rely much more heavily on external financing than the average electric utility. In order to help support SCE's ability to obtain external financing on attractive terms that benefit its customers, SCE must have an authorized return on equity that is higher than the return on equity that is awarded to the average-growth electric utility.

C. California's Approach to Electric Competition Continues to Create Uncertainty

In 1996, California stood at the forefront of electric industry restructuring with new laws deregulating wholesale electricity generation and allowing competition through competitive electric service providers, rather than their utility ("Direct Access" or "DA"). The flaws in these statutes became

[20] Excluding Edison International.

painfully apparent during the energy crisis of 2000-2001, as wholesale power prices rose to exorbitant levels. In response, the California legislature suspended Direct Access for additional customers and put in place a framework for the IOUs to enter into long-term power purchase agreements to ensure electricity supply to customers. Many of these contracts extend for up to 20 years over the life of generating plants and do not include "out" clauses that would protect SCE or its customers in the event of declining customer demand, changes in fuel availability or falling power prices. Safeguards are presently in place consistent with the regulatory compact, which assures recovery of reasonably incurred costs in exchange for ongoing regulation.

However, the long-term nature of these commitments combined with a renewed policy shift towards deregulation, leaves SCE with the risk that cost pressures could lead to legislative or regulatory policy changes to this compact. Efforts at renewed deregulation and electric competition, in the form of expanded Direct Access, Community Choice Aggregation and growth of distributed generation, continue to create business and regulatory uncertainty for IOUs. The magnitude of departing load, and, in turn, the possibility of its rapid return back to SCE as the backstop service provider, create a situation that is reminiscent of the past. The president of the CPUC recently acknowledged these substantial risks by noting "we are deregulating electric markets through dozens of different decisions and legislative actions, but we do not have a plan. If we are not careful, we can drift into another crisis."[21]

1. Direct Access

As discussed, California's Direct Access is a program to allow a limited selection of consumers living in the state of California to purchase their electricity from an Electric Service Provider ("ESPs"), instead of their utility. While utilities continue to provide consumers with electric delivery related services, ESPs are competitive providers that facilitate the sale of supply related products and

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[21] California Customer Choice, An Evaluation of Regulatory Framework Options for an Evolving Electricity Market, at iii (August 2018) *available at: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Cal%20Customer%20Choice%20Report%208-7-18%20rm.pdf.*

services. In the wake of the energy crisis, DA was suspended. Beginning in 2010, the amount of statewide power served by DA has been increasing due to legislation that required DA to be phased-in over time, up to a cap.[22] Limits have also been placed on how often a customer may shift between DA and utility electricity service. The phase-in and other Commission-adopted safeguards were designed to limit load volatility due to customer migration in or out of DA. Non-bypassable charges continue to be paid by DA customers to limit the shifting of costs for renewable energy, resource adequacy, and other fixed charges payable by all customers.

In 2018, Governor Brown signed into law SB 237, which further expands DA's annual electricity cap by 4,000 GWh, to a total of 28,000 GWh of load that can be served by ESPs. This expansion "will increase the share of statewide load in the DA market from about 13 percent today to about 15.5 percent."[23] The limited cap expansion helps to control load volatility due to customer migration into or out of the DA program. But the new law requires the Commission to submit a report to the state legislature by July 2020 on whether it should consider further re-opening the DA program. It is unknown at this time whether the Commission will, in its 2020 report to the legislature, recommend further re-opening of DA. This uncertainty makes it difficult for SCE to forecast the size of its customer base and the amount of bundled service load for which it must procure and generate electricity.

As described in Section III.B.3.b below, D.18-10-019, which was issued in Phase 1 of the Commission's Power Charge Indifference Adjustment ("PCIA") Rulemaking, reformed the methodology for calculating the costs for which departing load customers are responsible. The combination of the uncertainty of the amount of DA load in the future and the uncertainty of the aforementioned details related to cost recovery from departing load customers being worked out in Phase 2 of the PCIA Rulemaking, creates additional risk for SCE that is unlikely to be completely removed by the outcome of that proceeding.

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[22] *See* Decision 10-03-022, Appendix 1 (March 11, 2010).

[23] Jeff St. John, *How a New California Law Will Expand the State's Competitive Energy Market* (October 2, 2018), available at: https://www.greentechmedia.com/articles/read/california-law-will-expand-direct-access-market#gs.YnZlpsrF

Additionally, SB 237 provides that non-bypassable charges will continue to be paid by DA customers to limit the unfair shifting of costs for renewable energy, resource adequacy, and other fixed charges caused by all customers. The existing limits on how often a customer may shift between DA and utility service will also persist. While these safeguards will limit to some extent the unfair competitive advantages of DA providers, significant risks still remain. California's regulated electric utilities will remain providers of last resort, required to serve high-cost customers that DA providers may reject or be unable, under certain market conditions, to serve. They will likely continue to bear the main responsibility for system resource adequacy through procurement commitments. This back-stop role to support retail access and competition, and the potential impacts – both foreseeable and unknown – on SCE, create additional risk for its investors.

SCE faced similar uncertainty around direct access in its test year 2008 Cost of Capital case. At that time, this Commission acknowledged that "investors are awaiting California regulatory action on, among other matters, whether, when and how direct access would be restored in California and how our current hybrid energy market structure between regulation and competition will end up."[24] The Commission concluded that "investors' perceived California regulatory risks warrant a 10 basis point upward adjustment to the base ROE ranges being adopted in this proceeding."[25] SCE seeks a comparable adder in this case, which is embedded in our Base ROE request and, along with other non-wildfire risks described in this Section III and Exhibit SCE-02, justifies a Base ROE at the high end of Dr. Villadsen's range.

2. Community Choice Aggregations (CCAs)

In addition to increased DA, the utilities are also seeing a large departure of load to be served by CCAs. CCA permits customer groups, including cities or counties, acting alone or in purchasing groups, to procure electricity directly from wholesale non-utility suppliers.[26] The utility

[24] D.07-12-049, *Opinion On Test Year 2008 Cost Of Capital For The Major Energy Utilities*, p. 33 (December 20, 2007).

[25] *Id.*

[26] Eight states have enacted legislation enabling CCAs, *see* 2018 LEAN Energy, *CCA By State*, available at: http://leanenergyus.org/cca-by-state/

continues to provide distribution services, billing, and metering. Much like DA, the potential for CCA affects SCE's ability to reliably predict the size of its customer base and the amount of bundled service load for which it must procure or generate electricity. This adds to the risks of committing to longer-term resources because, as described above, the outcome of the PCIA Rulemaking is still to be determined and it is not yet clear whether the outcome will result in adequate cost recovery from all customers. As described in the previous section, there are aspects of the PCIA still being worked out and it is unclear when they will be resolved and whether the outcome will enable SCE to fully recover appropriate costs from departing load customers.

At the end of 2018, 4% of load in SCE's territory was served by CCAs.[27] However, this has already materially increased in 2019, and is expected to continue to increase rapidly. Some predict that over 85% of retail load could be served by sources other than IOUs by the middle 2020s.[28] There are no caps on the amount of load CCA providers can serve. It is easy for customers to join a CCA, because a customer must proactively opt out of a forming CCA to remain with their utility. Customers being served by a CCA can opt out at any time and return to utility service. Pursuant to SCE's tariffs, CCAs have the right to return customers to the utility for procurement service if they fail to pay their electric bills. In these situations, the utility must continue to serve as the provider of last resort. Additionally, the structure is not fixed and continues to change as CCAs grow. As a result, SCE faces the risk of making procurement – whether in response to legislative or CPUC mandates or based on load forecasts – that ultimately become unnecessary in light of departing load. This structure provides little certainty around the flow of customers to and from CCAs.

While CCAs are required to file implementation plans with the Commission to, among other things, describe how they will operate and when they will begin service, there is still risk for the utilities that the CCA will not comply with their own plans. For example, in August 2018, Desert Clean

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27 Based on 12-month sales ending December 2018 as a percent of 2018 retail sales.

28 CPUC Staff White Paper, *Consumer and Retail Choice, the Role of the Utility, and an Evolving Regulatory Framework*, p. 3 (May 2017).

Energy postponed its CCA launch just days before the intended launch date that they had communicated to their customers and SCE. SCE had already made costly and time-consuming plans in preparation for these customers' departures.[29] In addition, a CCA could cease providing service at any time and the customers would return to utility service without much, if any, warning. All of this uncertainty adds risk to SCE's long-term procurement – risk of ultimate recovery of procurement cost and risk of needing to provide services as a provider of last resort with the potential for very material and unexpected returning load. And again, these risks are borne by SCE's investors. And investors are taking note.[30]

In addition to the uncertainty around load that SCE will serve, additional risks remain related to the Power Charge Indifference Adjustment ("PCIA"). PCIA is "the mechanism to ensure that the customers who remain with the utility do not end up taking on the long-term financial obligations the utility incurred on behalf of now-departed customers,"[31] such as utility expenditures to build power plants and long-term power purchase contracts with independent power producers. In June 2017, the Commission instituted a rulemaking to consider changes to the PCIA methodology to comply with legislation that requires utility bundled service customers to remain financially indifferent to the departure of customers to DA and CCA service.[32] In October 2018, the Commission adopted D.18-10-019, which adopted a revised PCIA methodology, including an annual true-up mechanism and cap.[33] In addition, D.18-10-019 opened a second phase of the PCIA rulemaking to consider utility portfolio optimization, to establish a process for ESPs or CCAs choosing to prepay their PCIA

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29 https://www.desertsun.com/story/tech/science/energy/2018/08/07/your-power-company-still-southern-california-edison-now/915701002/.

30 *See e.g.,* S&P Global Market Intelligence, *California Utilities' Role As Energy Providers Faces Uncertain Future,* (April 5, 2019) available at: https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/50786307.

31 http://www.cpuc.ca.gov/PCIA/.

32 R.17-06-026, *Order Instituting Rulemaking To Review, Revise, And Consider Alternatives To The Power Charge Indifference Adjustment* (June 29, 2017).

33 D.18-10-019, *Decision Modifying The Power Charge Indifference Adjustment Methodology* (October 11, 2018).

obligation, to develop the true-up process for the market price benchmarks used to calculate the PCIA, and to consider other potential issues related to the PCIA.

While D.18-10-019 provides some certainty in terms of a revised PCIA methodology that provides a greater likelihood that bundled service customer will remain indifferent to departing customers, uncertainty remains around how accurate the true-up process will be, what impact the cap will have, and what potential portfolio optimization measures the Commission will require SCE to implement. Until these issues are resolved in Phase 2 of the PCIA rulemaking, and depending on how they are resolved, SCE is exposed to significant uncertainty and risk regarding procurement and load migration to and from the utility.

3. Self-Generation and New Technologies

As new DERs proliferate[34] and an increasing number of customers choose to install self-generation technologies, a larger part of the utility's fixed costs are avoided by these same customers. Through net energy metering ("NEM") billing arrangements and other state subsidy programs, customers who install self-generation technologies avoid paying for some transmission and distribution investment costs incurred by SCE, despite the fact that they continue to rely on the grid. Even though recent CPUC regulation requires NEM customers to pay certain non-bypassable charges moving forward; these are minimal, and cost avoidance still occurs. This shifts these costs to non-NEM customers and concentrates the costs on a smaller customer base. This trend will continue as the move from centralized generation to self-generation gathers more momentum.[35]

SCE has a three-tiered rate structure for residential customers. SCE's third tier, also known as the High Usage Charge ("HUC"), is currently 119% higher than its first tier, while its second tier is 25% higher than its first tier. SCE's high-usage customers effectively subsidize SCE's lower-

[34] SCE has nearly 2,500 MW of distributed generation interconnected to its grid and interconnects about 4,000 new residential solar customers every month. A 2018 ruling by the state's energy commission will require solar on almost all new homes built beginning in 2020. Storage is also growing rapidly. *See* California Distributed Generation Statistics, available at: https://www.californiadgstats.ca.gov/charts/ (reflecting data through Dec. 31, 2018).

[35] SCE calculates the NEM cost shift for residential customers at approximately $460 million in 2018.

usage customers. This provides an incentive for higher-usage customers to install self-generation DERs to avoid the upper tier rate and the HUC.[36] The costs these high usage customers are avoiding are then applied to a smaller pool of non-participating customers, putting upward pressure on customer rates.

Further, SCE's residential rates are volumetric with only a nominal fixed charge, though in reality, a substantial amount of SCE's costs do not vary with the volume of sales. This rate design adds to the risk of cost shift among residential customers when higher usage customers install self-generation or storage technologies. As SCE undertakes the migration of its eligible residential customers to time-of-use rates[37] commencing in October 2020, customers who install energy storage technologies will be able to avoid peak prices and shift costs to the remaining customer base.

Microgrids are also being considered by this Commission for grid resiliency and a means to serve load in hard-to-reach areas.[38] Microgrids are developing on corporate campuses with the emergence of a market for DERs and the availability of low-cost utility scale renewables. Most of these microgrids remain connected to the utility distribution network and operated by the utility as the distribution system operator, but SCE faces similar risks related to standby and departing load charges with respect to microgrids.

Indeed, the fundamental and transformative changes in the electric utility sector in California and the State's ambitious and progressive goals for de-carbonization and emissions reductions have increased the systematic risk that electric utilities are facing. The Commission should evaluate

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[36] *See* Severin Borenstein and James Bushnell, Davis Economics Energy Program, "The U.S. Electricity Industry after 20 Years of Restructuring," (Revised, May 2015), available at: https://policyinstitute.ucdavis.edu/files/DEEP_WP001.pdf ("Borenstein (2015) reports that a greatly disproportionate share of California households installing PV from 2007 to 2013 had consumption levels that reached into the two highest price tiers.").

[37] SCE's two residential time-of-use (TOU) default rates have peak periods of 4:00pm-9:00pm and 5:00pm-8:00pm, respectively. In a TOU rate structure, customers are charged higher rates during peak periods and lower rates during off-peak periods, thereby providing an economic incentive for customers to shift load from on-peak to off-peak time intervals.

[38] Christopher Villarreal, David Erickson, Marzia Zafar, CPUC's Policy & Planning Division, *Microgrids: A Regulatory Perspective,* (April 14, 2014), available at: http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5118

these compounding operational and business risks, and authorize a return that compensates for the heightened electric utility industry risks in California.

D. SCE Faces Unique Procurement Risks

1. The Procurement Planning Process

California is undergoing a significant procurement planning transition, from the Long-Term Procurement Planning ("LTPP") process to the Integrated Resource Plan ("IRP") process.[39] The IRP process was instituted by Senate Bill 350, known as the Clean Energy and Pollution Reduction Act of 2015 to "ensure that load serving entities ("LSEs") meet targets that allow the electricity sector to contribute to California's economy-wide greenhouse gas emissions reduction goals."[40] LSEs submitted their first IRPs in August 2018 and are awaiting a proposed decision on both individual LSE IRPs as well as plans for the system.

Because this is the first time the Commission and LSEs have gone through the IRP process, and issues have been identified that require remedy in the 2019-2020 or future cycles, there remains significant uncertainty around future requirements for the IRP itself and impacts on procurement. For example, the Commission has neither yet adopted, nor thoroughly studied, a system plan that aligns with the level of electricity sector decarbonization, and transportation and building end-use electrification required for the state to achieve its statutorily-mandated economy-wide GHG reductions.

The proposed system plan may not be sufficient to meet system reliability requirements.[41] The Commission's analysis notes that a substantial percentage of available gas capacity may become uncontracted, according to LSE plans, which raises questions around whether sufficient

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39 R.16-02-007, Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements (2016).

40 *See* CPUC, Integrated Resource Plan and Long Term Procurement Plan (IRP-LTPP), at http://www.cpuc.ca.gov/irp/

41 R.16-02-007, *Comments of SCE on ALJ Ruling Seeking Comment on Proposed Preferred System Portfolio and Transmission Planning Process Recommendation*s, pp. 3-4, 7-10, 11-12. (January 31, 2019).

reliability resources will remain in the market.[42] This has not been adequately studied in the IRP-LTPP proceeding to date.

Further, several CCAs noted that their IRPs filed with the Commission did not represent their "real" IRPs, which may not be available for Commission analysis or inclusion into the system plan.[43] The CPUC has acknowledged that the scope of its jurisdiction over CCA procurement is limited.[44] It is unclear what SCE's obligation will be if a CCA within its service territory fails to procure sufficient resources for system reliability or fails to meet its GHG reduction goals.

A similar issue occurred with respect to Resource Adequacy ("RA"). The Commission directed SCE to enter into negotiation to procure RA from the Ellwood and Ormond Beach generation facilities, which had been identified as resources necessary to fulfill local RA required by the CAISO.[45] However, as the resources were not under long-term contract, the resource owner notified the CAISO of its intent to shut down both facilities. The CAISO determined there was a reliability need for the capacity and initiated a process to procure capacity under a Reliability Must Run ("RMR") contract. This exemplifies the risk associated with not having long-term procurement authority, yet being required to enter into contracts to meet customer demand.

Another risk factor related to procurement is the uncertainty around the continued use of least-cost, best-fit ("LCBF") solicitation valuation methodology, which is under attack. SCE's LCBF

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42 ALJ Ruling Seeking Comment on Proposed Preferred System Portfolio and Transmission Planning Process Recommendations, Attachment A, pp. 23-24, 31-32. Available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M257/K914/257914008.PDF.

43 Comments of SCE on ALJ Ruling Seeking Comment on Proposed Preferred System Portfolio and Transmission Planning Process Recommendations, p. 21; Comments of SCE on Load-Serving Entities' Integrated Resource Plans, pp.7-11.

44 Decision (D.)18-02-018, at p. 26 ("The [CPUC's] authority is primarily with respect to the planning process, in order to assess the aggregated impact of all of the LSE plans combined … As we note below, with some exceptions related to renewable integration resources, the procurement decisions, customers rates, and contract terms and conditions (outside of the RPS) are the domain of the CCA governing boards and not the [CPUC].").

45 R.17-09-020, D.18-06-030, *Decision Adopting Local Capacity Obligations For 2019 And Refining The Resource Adequacy Program* p. 35 (June 21, 2018).

methodology employs a comparative net present value ("NPV") analysis to evaluate proposals submitted through competitive solicitations, while taking into consideration qualitative attributes associated with each bid.[46] This approach reflects the fact that the lowest cost bids are not always the best value or fit for SCE's needs.

Stakeholders such as California Public Advocates Office (CalPA) have opposed SCE's use of LCBF on several occasions and, in some instances, the Commission has agreed with them. In SCE's recent SB 801 energy storage RFO, the Energy Division initially agreed with CalPA that SCE should use highest NPV, rather than LCBF, to select projects,[47] though they did eventually allow SCE to use its LCBF methodology in the final Resolution.[48] In addition, the original Proposed Decision on SCE's Preferred Resources Pilot RFO 2 concluded that the NPV numbers in SCE's solicitation, when compared to the potential qualitative benefits, were not enough "to justify the procurement costs as reasonable and cost-effective."[49] If the Commission starts choosing highest NPV, or some other valuation methodology rather than LCBF, it could add risk for SCE's procurement.

Other risks are also prevalent with respect to the procurement of energy storage, in particular. SCE is on track to achieve its energy storage procurement target to procure 580 MW of storage by 2020.[50] However, much uncertainty remains in the energy storage space. For example, to date, the majority of energy storage procured by the IOUs has been lithium ion battery storage. The Commission and other stakeholders have expressed interest in "whether policy should support a diverse set of technologies in the energy storage procurement activity of the [IOUs]."[51] The Commission has not yet taken a position on the matter, but has created uncertainty on whether there will be additional

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[46] D.04-12-048, p. 127.

[47] Original Draft Resolution E-4937, published on June 20, 2018, pp. 7-8.

[48] Resolution E-4937, issued on August 9, 2018, pp. 7-8.

[49] A. 16-11-002, Proposed Decision (Rev. 1) *Denying The Application Of Southern California Edison Company,* p. 29 (February 23, 2018).

[50] D.13-10-040 (implementing AB 2514).

[51] D.18-10-036, p. 24.

energy storage procurement mandates to achieve technology diversity.[52] Further, stakeholders are pushing for more energy storage procurement mandates.[53]

Storage is a relatively new technology, which carries additional risks. The lack of a long-term track record for both the equipment and business models used to provide the technology creates additional risk that the technology may not perform as anticipated, contract disputes may arise, and the seller may default rather than remedy issues. The prospect of requirements to procure additional, potentially-costly energy storage, particularly if the requirement does not align with Commission-adopted use cases for energy storage, which are intended to be technology-neutral,[54] adds risk for SCE.

2. Gas Market Risks

SCE procures significant amounts of gas to use as fuel for its gas-fired generation facilities, so is exposed to fluctuations in the natural gas market. In 2017, SCE spent approximately $308 million on natural gas purchases.[55] SCE also procures electricity from other suppliers who rely on the gas markets, so has indirect exposure to gas market volatility through these transactions.

There are several issues currently having significant impacts on natural gas prices and creating exposure for SCE. First, there are gas system constraints in Southern California due, in part to the response to the 2015 Aliso Canyon Gas Storage Facility gas leak, as well as several other extended pipeline outages. These constraints have led to frequent Operational Flow Orders ("OFOs"), or orders to take certain actions to alleviate system conditions. The OFO typically carries a penalty price for gas

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[52] *Id,* p. 25 ("This topic may be most appropriately suited for consideration in a potential future energy storage rulemaking").

[53] Application (A.)18-03-002, *Comments of the California Energy Storage Alliance to Assigned Commissioner's and Assigned Administrative Law Judge's Ruling Requesting Comments on Issues Pertaining to Energy Storage Technology Diversity*, filed Aug. 28, 2018, at pp. 6-10. (Suggesting that the Commission adopt a new Energy Storage Emerging Technology Procurement Plan that is incremental to the existing AB 2514 targets.").

[54] D.13-10-040, p. 39.

[55] This amount is reflected in the Attachment D to each of SCE's 2017 CPUC Quarterly Compliance Reports, Advice 3595-E, Advice 3636-E, Advice 3683-E, and Advice 3735-E.

imbalance outside of specified ranges – penalties that can exceed $25/mmbtu. Even the threat of such penalties has significant price impacts on gas, and in turn, on power prices.

Since CAISO energy prices are frequently set by the marginal gas generator, spikes in gas prices can result in dramatic spikes in power prices. For example, in July of 2017, in part due to natural gas prices in Southern California reaching about $40/mmbtu, CAISO energy prices reached almost $1000/MWh. For the week of July 23, 2017, SCE estimated that high gas prices cost its customers an additional $150 million compared to average July prices.[56] Moreover, in part due to high gas prices, in 2018 SCE's procurement resulted in an undercollection of over $815 million (where procurement costs exceeded the amounts collected in rates) and SCE was required to file with the CPUC to increase rates.[57]

Given SCE's role in procurement, events that create material additional market costs tend to have negative customer and business impacts. High prices increase costs to customers and increase the risk of, and potential magnitude of, a disallowance to SCE and put additional pressures on regulators to reduce customer rates (in the short-term) by restricting needed investment in the utility.

3. Renewables Market

To support California's ambitious environmental goals, SCE has substantial long-term power purchase contracts. These create risks in a regulatory, legal and technological environment that is rapidly changing. For the last decade, SCE has entered into a significant amount of renewable energy long-term contracts. According to SCE's most recent "Change in Status" filing, the "Asset Appendix: Long-Term Firm Power Purchase Agreements (PPA)" shows over 11,000 MW of long-term firm power purchase agreements subject to the Commission's Market Base Rate (MBR) reporting requirements."[58]

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[56] I.17-02-002, Joint Motion Of Southern California Edison Company (U 338-E) and Southern California Generation Coalition for Expedited Relief, at p. 14 (filed Aug. 10, 2018).

[57] SCE Advice 3954-E to the CPUC, *Implementation of the Expedited Application of Southern California Edison Company Regarding Energy Resource Recovery Account Trigger Mechanism in Compliance with Decision 19-01-045* (submitted Feb. 15, 2019).

[58] FERC Dkt. No. ER10-1355-007, *SCE Notification of Change in Status (CIS) reported under ER10-1355-006*, (filed January 30, 2019).

As of December 31, 2017 SCE reported contractual obligations for power purchase agreements of $39,877 million.[59]

A major financial risk associated with SCE's power procurement stems from the burden of long-term purchased power capacity payments. Increased competition and/or changes in generation technology could leave SCE with contracts for unneeded and high cost power. SCE estimates that the above market costs of its current portfolio, including both renewable and conventional generation, overall, is priced significantly above market. That is, if SCE were to liquidate its portfolio, the revenues generated from the sale would not cover the payments required under the contracts. For example, looking at the contracted wind and solar in SCE's portfolio, from 2019 through 2035, the portfolio is estimated to have costs over $12 billion dollars of above market value.[60]

Among its costlier programs are SCE's several mandated renewables procurement programs — the Biofuel Renewable Auction Mechanism ("BioRAM"), the Renewable Market Adjusting Tariff ("Re-MAT"), and the Bioenergy Market Adjusting Tariff ("BioMAT"). All three of these programs are undergoing modifications that will have impacts on SCE's procurement, although the scope and extent of the impacts are not clear.

On January 31, 2019, the Commission adopted Resolution E-4977 directing the IOUs to, pursuant to SB 901, offer five-year extensions for existing five-year BioRAM contracts to eligible sellers that meet certain conditions.[61] These contracts are among the most expensive in SCE's portfolio and at this time it is not known which sellers will accept the extension.

BioMAT is in the midst of an Energy Division review, which was prompted when the offer price for certain BioMAT products crossed the program's price cap for two consecutive program periods. On October 30, 2018, Energy Division released its BioMAT Program Review and Staff

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[59] *Edison International and Southern California Edison, 2017 Financial & Statistical Report*, at p. 5, available at: https://www.edison.com/content/dam/eix/documents/investors/sec-filings-financials/2017-financial-statistical-report.pdf.

[60] R.17-06-026, SCE estimated the above market costs of its current portfolio. This included both renewable (RPS) and conventional generation.

[61] Resolution E-4977, *Commission Motion Amending the Bioenergy Renewable Auction Mechanism (BioRAM) Program and Authorizing the Extension of Certain Contracts pursuant to Senate Bill 901* (January 31, 2019).

Proposal for informal comment. The Staff Proposal covers many aspects of the BioMAT program and it is not clear what program changes may be adopted by the Commission or when the changes will be required. For example, one modification the Energy Division is considering is transitioning from a price adjusting mechanism to a fixed price feed-in-tariff. Such a consideration adds risk because the prices may not be market-based and it is unclear how they would be established and how and when prices could be adjusted. The Energy Division is also considering extending the program from 2021 to 2026 and revisions to procurement cost allocation. In summary, the mandated renewables procurement programs are undergoing multiple changes, the uncertainties of which create additional risk for SCE.

E. Regulatory Risk from Cost Recovery Risk and Regulatory Lag are High In California

This Commission has explained that "[r]egulatory risk pertains to new risks that investors may face from future regulatory actions that we, and other regulatory agencies, might take."[62] Examples, include "the potential disallowance of operating expenses and rate base additions, comparability of utility ROEs throughout the United States and rating agencies' outlooks for the California regulatory environment."[63] The *Introduction to Cost of Capital* explains that "the two main types of regulatory risks are regulatory lag risk and cost recovery risk."[64] Those risks are significantly greater for California utilities.

1. Cost Recovery Risk

In the 2008 Cost of Capital decision, this Commission explained its decision not to award the IOUs a risk premium for perceived regulatory risk in California because the Commission "has done

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62 D.07-12-049, p. 31.

63 *Id.*

64 *An Introduction to Utility Cost of Capital,* p. 8 (April 18, 2017), available at http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPD_Work_Products_(2014_forward)/PPD-An-Introduction-to-Utility-Cost-of-Capital.pdf

much to mitigate investor risks since the height of the California energy crisis."[65] The Commission stated "[t]here is no basis to conclude that we will do otherwise in the future."[66]

As discussed in Section IV related to wildfire cost recovery, there is now a strong basis to be concerned that the Commission may not do enough to mitigate investor risks related to wildfires. The State's investment risk profile has become increasingly negative due to recent catastrophic wildfires, the application of inverse condemnation with a strict liability standard, and the Commission's unclear and prolonged cost recovery process. This view contributed to PG&E's bankruptcy filing, the second such filing within twenty years, and S&P, Moody's, and Fitch downgrades of SCE and San Diego Gas & Electric Company ("SDG&E). S&P placed SCE's credit rating on "CreditWatch negative" status and suggested that additional downgrades may be imminent due to the current wildfire cost recovery framework:

> The CreditWatch negative placement reflects the increased likelihood that [SCE] will continue to experience catastrophic wildfires because of climate change and without sufficient regulatory protections …. We could lower our ratings on the company by one or more notches if regulators and or politicians do not take concrete steps to explicitly address these growing risks in the next few months.[67]

Although SCE's issuer and debt issuance credit ratings are at the low end of investment grade, SCE's preferred and preference equity are now non-investment grade.

Investors have one case to guide their assessment of wildfire cost recovery regulatory risk. That case, which addressed SDG&E's ability to recovery costs from wildfires that occurred in 2007, was decided ten years after the fact, at the end of 2017. Moreover, the decision held SDG&E's shareholders responsible for 100% of the costs, despite the fact that the Federal Energy Regulatory Commission ("FERC") allowed SDG&E to recover 100% of the FERC costs associated with the same

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65 D.07-12-049, p. 30.

66 *Id.*

67 Press Release, Standard & Poor's, Edison International and Subsidiary Southern California Edison Downgraded to 'BBB'; Ratings Placed On Watch Negative (Jan. 21, 2019) *available at* https://www.standardandpoors.com/en_US/web/guest/article/-/view/type/HTML/id/2155495. (Registration required for access.)

wildfires. What IOUs are faced with in California is a cost recovery framework that, when considering the same underlying events as SCE's federal regulator, produces the opposite results. While SCE addresses wildfire risk separately in Section IV, the wildfire framework in California is indicative of a generally riskier regulatory environment in California in terms of cost recovery.

2. Regulatory Lag

Regulatory lag is the delay, beyond the statutory period and measured in months, in the ability of a utility to recover its costs, due to regulatory delay. This Commission has recognized that regulatory lag "introduces uncertainty in outcome" and that the associated risk is assessed by rating agencies "in setting utility bond ratings."[68] Although the CPUC is statutorily required to complete rate cases within 18 months,[69] the CPUC's position is that "regulatory lag does not exist prior to the requested effective date,"[70] that is, the start of the test year.

Edison Electric Institute ("EEI") has reported that regulatory lag in GRCs, which it measures from the time from a rate case filing to the decision,[71] averages about 10 months across all utilities[72] and that average has not exceeded 24 months in the last 30 years.

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68 *An Introduction to Utility Cost of Capital, supra* n. 64, p. 8.

69 *See e.g.,* A.16-09-001, *Scoping Memo And Joint Ruling Of Assigned Commissioner And Administrative Law Judges*, p. 19 (filed December 2, 2016) ("It is the Commission's intent to complete this proceeding within 18 months of the date this Scoping Memo is filed."). Pub. Util. Code § 1701.5(a) now provides that ratesetting proceedings must be resolved within 18 months *of initiation* unless the Commission makes findings why that deadline cannot be met and issues an order extending that deadline.

70 D.12-12-034, *Decision On Test Year 2013 Cost Of Capital For The Major Energy Utilities*, p. 36 (December 20, 2012).

71 EEI has indicated that in that data set, it defined regulatory lag as the time between a rate case filing and decision, because this serves as a rough proxy for the time between when a utility needs recovery and when the new rates take effect and it is a result that can specifically be determined.

72 Edison Electric Institute, *Rate Case Summary,* Q4 2017 Financial Update, (December 31, 2017), available at: http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/QtrlyFinancialUpdates/Documents/QFU_Rate_Case/2017_Q4_Rate_Case.pdf

As shown in Figure III-5, while GRC delays in California are not "a new risk"[73] SCE's GRC delays have been steadily increasing, with its 2006 GRC only 4.3 months late and the 2018 GRC at least 15.8 months late, using the CPUC's method of measuring lag.

Figure III-5
SCE GRC Regulatory Lag Trend Over Time

Test Year	Decision Date	Delay After Start of Test Year	Delay Per EEI Metric (Filing Date)
2006	May 11, 2006	4.3 months	~17 months
2009	March 12, 2009	2.3 months	~16 months
2012	November 29, 2012	10.9 months	~24 months
2015	November 5, 2015	10.1 months	~24 months
2018	After April 22, 2019[74]	15.8+ months	~30+ months

Regulatory lag experienced in California is also greater than what other states experience, on average. Even accepting the CPUC's calculation method, regulatory lag of over 15 months after the beginning of the 2018 test year is well-above the 10-month national average. In referencing these statistics, SCE does not intend to level criticism at the CPUC. To the contrary, SCE appreciates the significant staffing and budgetary constraints the CPUC staff face.[75] SCE is only providing this data to demonstrate that regulatory lag in California is greater than other states and this translates to greater regulatory risk for California IOUs.

Moreover, although the creation of a memorandum account that is backdated to the beginning of the test year preserves the utility's opportunity to recover a full year's revenue requirement, it does not cure all the problems that arise from a delayed GRC decision. For example, SCE has had to budget its 2018 capital expenditures and expenses and incur most of the associated costs without knowing what the Commission will ultimately authorize for the year. If SCE "guesses wrong" on the

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[73] D.12-12-034, p. 36.

[74] A Proposed Decision was issued on April 11, 2019.

[75] Siliconbeat, Mark Ferron's fiery farewell from the California Public Utilities Commission (January 21, 2014) ("The CPUC itself has many challenges: an underfunded, understaffed agency that faces a "demographic time bomb, with our younger talent leaving for private industry and our most experienced staff on the verge of retirement.").

overall spending the Commission ultimately approves in SCE's 2018 general rate case decision, it will not be able to remediate this overspend, given that the test year has come and gone. This means investors are at risk for the spending decisions SCE has had to make in the absence of Commission authorization. Having to invest billions in capital without budgetary guidance from a GRC is an example of both regulatory lag and regulatory risk. Additionally, a late decision that cuts O&M may not leave enough time to pivot and manage our business in a way that optimizes our opportunity to earn our authorized rate of return. SCE's alternative – suspending planned programs to avoid disallowance risk – also comes with costs, such as delaying (and potentially losing) vendor contracts, being unprepared to ramp up to internal staffing and budget changes, and system plans becoming stale.

This regulatory lag risk is illustrated by SCE's Equipment Demonstration & Evaluation Facility or "EDEF" program, which was included in its 2015 GRC. The Proposed Decision, which denied the EDEF funding, was not issued until September of the 2015 test year. The Commission's final decision, which ultimately adopted the reductions found in the Proposed Decision, was issued on November 5, 2015. SCE had not anticipated any disallowance of funding, since its request was unopposed. So SCE had proceeded with constructing EDEF, and incurred expenditures on the labs consistent with the proposals in its 2015 GRC application. As of December 2015, SCE had already spent $5.2 million on EDEF. In this example, the fact that a memorandum account had been established for test year 2015 did not protect SCE from disallowance due to a rate case decision that extended beyond the beginning of the test year. The ultimate recovery of these funds remains undetermined.

Equity analysts have noted GRC delay in their assessment of SCE's stock. For example, Macquarie Research listed "the outcome of the pending GRC" as one of the risks weighing down SCE's stock price.[76] Guggenheim likewise concluded that "the GRC outcome is unlikely in the remainder of

[76] Macquarie Research, *Edison International (EIX US) Awaiting GRC and Thomas Fire Updates*, (January 7, 2019).

2018 and the company may under-earn their allowed ROE in 2018 unless supported with cost cuts elsewhere in the business."[77]

F. Shareholders Have Risks from Debt and Other Fixed Charges

Section V discusses SCE's credit ratings and sets forth its recommended ratemaking capital structure. Although that Section's primary focus is credit metrics and leverage for bond rating purposes, these factors also affect common equity shareholders. Equity-holders' claims to income from operations and to company assets in the event of bankruptcy are subordinated to bondholders. Thus, equity investors assess the amount of debt outstanding, the size of interest payments, and the existence of other fixed payments from long-term obligations in their investment decisions.

Equity holders face risks from long-term obligations that affect their future income stream. These include power purchase contracts commitments (known as "debt equivalence" or "DE") and the unfunded portion of pension and retiree medical benefits that SCE provides to its employees. This also includes any wildfire-related claims not recovered from insurance or customers. When all unfunded obligations are considered, SCE's leverage picture looks far different than its ratemaking capital structure.

Figure III-6 below shows three alternative views of SCE's recorded capital structure as of December 31, 2018. The first column on the left shows recorded capital structure for ratemaking purposes, which includes only the net proceeds from long-term debt and excludes any short-term debt.[78] As the chart shows, the recorded equity ratio of 49% is higher than the authorized ratemaking equity ratio of 48%. The middle column considers all short-term and long-term debt, and also adjusts the preferred equity amount for its debt-like characteristics. From a financial perspective, SCE's debt ratio increases to 54% from its ratemaking calculation of 43%.The final column shows the impact of adding long-term commitments, including power contracts, unfunded retirement benefits and the wildfire

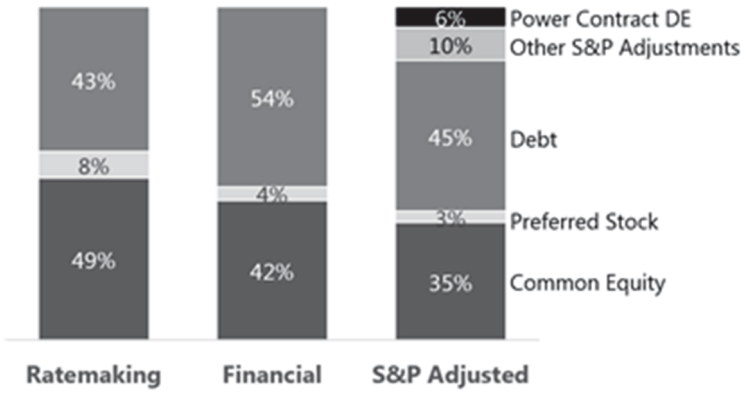
[77] Guggenheim: Power, Utilities & Alternative Energy Report, *The Guggenheim Daily Transmission: AVA, EIX, D, SCG, ETR, FERC, PCG, PJM, WEC,* p. 2 (December 7, 2018).

[78] As per SCE's waiver application, A.19-02-017, filed on February 28, 2019, the ratemaking capital structure excludes the $1.8 billion wildfire-related reserve that SCE recorded in December 2018.

reserve SCE recorded in 2018.[79] The debt equivalence calculations are based on S&P's adjustments, which impute 25% of the value of future power capacity payments as debt.

These adjustments add $2.0 billion to SCE's reported debt of $14.8 billion. S&P also adds $2.7 billion for the wildfire reserve SCE recorded in late 2018, increasing SCE's year-end 2018 leverage burden to approximately 61%. S&P considers regulated utilities with debt ratios over 50% to have "aggressive" leverage. Because these are sizeable long-term commitments, this risk to equity holders is substantial and ongoing.

Figure III-6
SCE 2018 Recorded Capital Structure Ratemaking, Financial and Adjusted



In prior Commission cost of capital proceedings, SCE has been authorized specific components to address the leverage and risk factors specific to procurement. Regarding risk factor impacts on ROE, in the 2008 decision, a risk adder of 50 basis points was adopted by the Commission.[80] This credit supportive action for equity holders is embodied in SCE's requested capital structure and is recommended for continuation in this application.

[79] Data extracted from S&P Capital IQ, Southern California Edison Company CreditStats Direct® > Balance Sheet, Debt, Adj. (March 24, 2019).

[80] D.07-12-049, *Opinion On Test Year 2008 Cost Of Capital For The Major Energy Utilities*, p. 30 ("Based on informed judgment, a 50 basis point premium for debt leverage, debt equivalence and procurement risk should be added to the ROE base range for SCE…").

IV.

WILDFIRE RISK ROE

A. Wildfires Pose the Most Immediate and Extreme Risk that SCE is Facing

It is beyond dispute that California's wildfire risk has dramatically increased, resulting in a "new abnormal" of year-round and potentially catastrophic wildfires. This is due to a number of factors, including climate change-driven weather events, such as extreme heat, severe drought, and high winds as well as the growing wildland-urban interface. Based on more than 100 years of data, the average temperature for California has risen 0.2°F per decade, with its warmest on record in July 2018.[81] Combined with the drought, forest management policies have resulted in a gradual accumulation of unmanaged vegetation. The state has approximately 130 million dead trees on approximately 9 million acres due to long-term drought conditions and bark beetle infestation.[82] These dried vegetation serve as kindling and fuel, which intensifies the problem. Approximately 35% percent of SCE's territory is located within a high fire risk area – 27% in CPUC-defined areas and another eight percent in areas designated by SCE and under review.[83] Many of the factors that contribute to the ignition and spread of California's most devastating wildfires, and their tragic consequences, are not within SCE's control.

These factors together have increased the duration of the wildfire season and the risk of catastrophic wildfire events. Cal Fire reports that 5,143 fires occurred in 2015, burning about 307,560

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81 National Oceanic and Atmospheric Administration, National Centers for Environmental Information, *Assessing the U.S. Climate in July* 2018, available at: https://www.ncei.noaa.gov/news/national-climate-201807, information accessed on April 4, 2019.

82 U.S. Forest Service, News release (December 12, 2017), available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd566303.pdf, information accessed on 8/23/18.

83 CPUC's maps were adopted as part of CPUC Decision 17-12-024, issued on December 21, 2017, and include areas considered to be "elevated risk" (Tier 2) and "extreme risk" (Tier 3) for wildfires. Prior to the creation of the CPUC's maps, SCE in 1996 designated portions of its service area as high fire risk based upon California Department of Forestry and Fire Protection's ("CAL FIRE") Fire Hazard Severity Zone maps. Prior to 1996, SCE also used internal data sources on fire history, fuels, wind, and urban construction to determine its high-fire risk area boundaries. SCE will continue to assess these boundaries through its participation in CPUC Rulemaking (R.)18-10-007, *Southern California Edison Company's (U 338-E) 2019 Wildfire Mitigation Plan,* filed Feb. 6, 2019 (see p. 28).

acres.[84] By 2017, those numbers had increased to 7,117 fires burning 505,956 acres.[85] The intensity of California wildfires has increased over time, as two-thirds of the State's largest fires on record have occurred in the last 20 years.[86]

B. SCE has Taken Actions to Strengthen its System to Protect Against Fires

In this challenging environment, SCE is enhancing its electrical system to mitigate wildfire risk and continuing to implement leading clean energy policies in order to meet its core objective of safely delivering reliable, affordable, and clean electricity to customers. The new abnormal that climate change brings, with a greater intensity of fire danger, is driving the need for further evolution of the grid—particularly in SCE's high-fire risk areas to prevent, mitigate, and withstand the immense wildfire threat that exists in California.

SCE has taken substantial steps to strengthen its system and manage its risk to protect against wildfire threats. SCE invests significant amounts of capital to reduce wildfire risk, with the goal of ensuring safety and maintaining reliability. As discussed in Section III.B.2, SCE's work under the GS&RP and WMP will further harden infrastructure, bolster situational awareness capabilities, enhance operational practices and harness the power of data and technology to address the increasing climate-change driven threat of wildfires.[87] The GS&RP goes beyond existing State standards and traditional utility practices to incorporate leading mitigation measures from around the world, selected based on their effectiveness.

SCE has also increased vegetation management patrols in high-fire risk areas, and is evaluating opportunities for expansive tree trimming and tree removal. During high-fire risk conditions, SCE restricts specific types of work and proactively de-energizes circuits if data sources indicate that extreme

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[84] Cal Fire Incident Information, available at http://cdfdata.fire.ca.gov/incidents/incidents_stats?year=2016.

[85] Cal Fire Incident Information, available at http://cdfdata.fire.ca.gov/incidents/incidents_stats?year=2017.

[86] CalFire, Fact Sheet *The Top 20 Largest California Wildfires*, March 14, 2019, *available at* http://www.fire.ca.gov/communications/downloads/fact_sheets/Top20_Acres.pdf.

[87] R.18-10-007, *Southern California Edison Company's 2019 Wildfire Mitigation Plan,* p. 97 (February 6, 2019).

local weather conditions pose an imminent and significant threat to public safety associated with the risk of wildfire.[88] SCE also maintains a 24-hour situational awareness center and around-the-clock incident management teams when needed.

These actions are intended to reduce the likelihood of electrical infrastructure-associated ignitions that could lead to wildfires, make the grid more resilient in the presence of a wildfire, and provide greater situational awareness to SCE grid operators and first responders such as fire crews and SCE line crews. While SCE is taking these prudent and innovative actions, the capital-based mitigations will require years to fully implement. And, critically, the sum total of these actions cannot address all issues and potential risks SCE faces. California wildfire risk is a societal problem, and one that can only be addressed through the informed collaboration of all stakeholders, under the leadership of the State government. SCE is proactively engaging with regulators, legislative leaders, fire agencies, and other stakeholders to mitigate risk. The ability for SCE to access capital is critical in order to implement measures that will enhance safety and build grid resiliency against future wildfires.

C. California's Inverse Condemnation and Wildfire Cost Recovery Policies Create Unique Risks for California IOUs

California courts apply a doctrine called inverse condemnation to IOUs, holding them strictly liable when their facilities are a substantial cause of a wildfire. A plaintiff who prevails in an inverse condemnation claim is entitled to recover both property damage and associated interest and attorneys' fees. As a result, SCE can be held liable and required to pay judgments for property damages and attorney's fees, regardless of fault. Cost recovery is then determined by the CPUC and/or FERC.

San Diego Gas & Electric Company ("SDG&E") experienced catastrophic wildfires in 2007. A full ten years later, on November 30, 2017, the CPUC denied SDG&E's application for cost recovery of

[88] SCE's de-energization protocol, officially titled Public Safety Power Shut-Off ("PSPS"), consists of a set of de-energization and re-energization protocols and guidelines with a wide variety of factors considered.

approximately $380 million of costs above their insurance coverage.[89] The CPUC rejected recovery of all CPUC-jurisdictional wildfire-related costs based on a determination that SDG&E did not meet the CPUC's prudent manager standard. This determination was made despite the fact that the Federal Energy Regulatory Commission ("FERC") found that SDG&E acted reasonably in settling the same cases and approved the FERC-jurisdictional portion of the wildfire cost request.[90] This disparate result between the FERC and the CPUC is indicative of a riskier and less predictable regulatory environment for California utilities.

SCE believes that the CPUC applied the standard incorrectly by engaging in an impermissible hindsight review, requiring perfection, and denying cost recovery based on conduct with no causal nexus to the fire. SCE will seek recovery of the CPUC portion of uninsured damages through its Wildfire Event Memorandum Account ("WEMA"). Nevertheless, the SDG&E decision is the only directly comparable precedent in which a California IOU has sought recovery for uninsured wildfire-related costs. The SDG&E decision therefore creates new, extreme risks for the California utilities.

D. SB 901 is Not Enough

Following a year of extreme weather events including wildfires and mudslides, California Governor Edmund G. Brown Jr. joined legislative leaders in March 2018 to develop a solution to protect the State against natural disasters. In July 2018, the Wildfire Preparedness and Response Legislative Conference Committee put forth Senate Bill ("SB") 901, a vehicle that was intended to protect customers and help utilities pay for wildfire damages. Governor Brown signed it into law in September 2018.

Unfortunately, SB 901 did not sufficiently address the long-term financial risk that SCE and other California IOUs are facing, including inverse condemnation costs, liquidity, and cost recovery. Credit rating actions have reflected this. In July 2018, before SB 901 was passed in the legislature, S&P

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[89] A.15-09-010, Decision (D.)17-11-033, *Decision Denying Application* (issued December 6, 2017); *reh'g denied,* D.18-07-025 *Order Denying Rehearing of D.17-11-033* (July 12, 2018) ("SDG&E WEMA Decision").

[90] *San Diego Gas & Electric Company,* 146 FERC P63, 017, ¶¶ 56, 61-62 (2014).

changed SCE's outlook to negative from stable, reflecting the concern that California would not pass an adequate bill by the end of the legislative session. Even though SB 901 was approved on the last day of the California legislative session on August 31, 2018, S&P confirmed SCE's negative outlook and revised their assessment of SCE's business risk profiles downward in early September 2018.[91] Contemporaneously, Moody's downgraded SCE's credit rating from A2 to A3.[92]

The credit rating agencies have captured the sentiment of the investor community. The lack of investor confidence in the utility-regulatory compact is evidenced by investor reaction to the devastating California wildfires that started in November 2018. On December 3, 2018, Moody's changed SCE's ratings outlook from stable to negative, stating

> The Woolsey fire, which is similar to the size of the Thomas fire last year, has created another large contingent exposure for SCE…the cumulative exposure to wildfires fanned by the effects of climate change are materializing faster than we originally expected. Efforts to insulate the utilities, in the form of new laws or regulations, will be slow and drawn out, putting downward pressure on its credit rating.[93]

Then, on January 21, 2019, S&P lowered its issuer credit rating on EIX and SCE from BBB+ to BBB,[94] describing SB 901 as "a first step to protect the credit quality of utilities" but calling for "further

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[91] *Edison International And Subsidiary Ratings Affirmed, Outlook Remains Negative*, S&P Global Ratings, September 5, 2018 ("[w]hile SB 901 also includes the creation of a special commission that could establish ways to socialize the wildfire costs in an equitable manner, such as through the creation of a catastrophic wildfire fund that we assess as supportive of utility longer-term credit quality, we view these development as being unproven and in their very early stages.").

[92] *Rating Action: Moody's downgrades Southern California Edison to A3 from A2 and Edison International to Baa1 from A3; outlooks stable*, Moody's Investors Service, p. 1 (September 6, 2018), available at: https://www.moodys.com/research/Moodys-downgrades-Southern-California-Edison-to-A3-from-A2-and--PR_388504, ("The continued existence of inverse condemnation and exposure to political agendas is the principal rationale behind [the September 6, 2018] rating downgrade. SB901 failed to address the most important risk factor, inverse condemnation, and the benefits it provides are dependent on implementation by state regulators.").

[93] Moody's Investors Service, *Rating Action: Moody's revises the ratings outlook of Southern California Edison and Edison International to negative*, p. 1. (December 3, 2018) *available at:* https://www.moodys.com/research/Moodys-revises-the-ratings-outlook-of-Southern-California-Edison-and--PR_392015.

[94] Usman Kahlid, S&P Global Market Intelligence: *S&P downgrades SDG&E, SoCalEd, Edison International on Wildfire, Climate Risk* (January 22, 2019) available at: https://www.spglobal.com/marketintelligence/en/news-insights/trending/NaiINRvWoP7CkJgiOoSjIQ2.

reform to help shield the companies from the risks of the state's unique inverse condemnation policy."[95] On January 24, 2019, Moody's placed SCE under review for another credit rating downgrade,[96] echoing S&P's criticism of the regulatory, legislative, and political environment in California and the issues surrounding inverse condemnation. Moody's subsequently downgraded SCE from A3 to Baa2 on March 5, 2019.[97] Even with SB 901, investor confidence in the State's regulatory construct is rapidly deteriorating: the State's largest IOU has declared bankruptcy, and its other large IOUs, including SCE, have been downgraded and placed on negative watch with the potential for downgrades to non-investment grade credit ratings. Even SDG&E's ratings have been downgraded, without any wildfire litigation pending. Acknowledging these downgrades, Governor Newsom recently tasked his strike force with developing a comprehensive strategy that, among other important objectives, provides "sufficient certainty to investors and credit ratings agencies to avoid downgrades of utilities that could cause further bankruptcies and/or drive up borrowing costs, each of which raises prices for utility customers."[98]

E. A Durable Cost Recovery Framework is Needed

In return for a duty to serve all customers, regardless of risk, IOUs are entitled to recover their costs of service in rates, where those costs are determined to be just and reasonable. This is the regulatory contract in its most fundamental form. The current wildfire cost recovery framework, with an unclear and prolonged cost recovery process, breaks that regulatory contract. Moreover, it has created an increasingly negative investment risk profile in the eyes of investors.

One of the most important things that the Commission can do is to establish a clear, durable, and repeatable process for assessing the prudency of IOU wildfire operations that enables timely cost

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[95] *Id.,* p.2-3.

[96] *Rating Action: Moody's places Edison and Southern California Edison under review for downgrade*, Moody's Investors Service, January 24, 2019, available at: https://www.moodys.com/research/Moodys-places-Edison-and-Southern-California-Edison-under-review-for--PR_394211

[97] *Moody's downgrades Edison International to Baa3 and Southern California Edison to Baa2; outlooks negative* (March 5, 2019), available at: https://www.moodys.com/research/Moodys-downgrades-Edison-International-to-Baa3-and-Southern-California-Edison--PR_396014 (registration required).

[98] *Governor Newsom's Strike Force Report, supra,* n. 8, p. 4.

recovery of prudently-incurred, wildfire-related expenses. This includes payments to settle claims where utility facilities are alleged to be a significant cause of a wildfire ignition when those payments exceed the limits of the utility's insurance. The Commission has the authority to address the continuing wildfire crisis by implementing a cost recovery framework that is more aligned with the proven model adopted in AB 57, i.e.,[99] one that provides upfront certainty regarding the standards that will apply when a wildfire event occurs. A key feature of that model was directly tying compliance reviews to cost recovery, facilitating the prompt review of utility procurement operations and associated recovery of procurement costs (or imposition of disallowances in instances of non-compliance that were also subsequently found to be imprudent through an accelerated reasonableness review). SCE has advocated that this Commission adopt a similar framework for wildfires, one that ties SCE's culpability to non-compliance with SCE's wildfire mitigation plan and requires that such non-compliance be a substantial cause of the wildfire.[100] Without such a framework for wildfire risk, and given the length of time between a wildfire event and the resolution of cost recovery under the existing process, equity investors will require a higher risk-adjusted return regardless of the ultimate recovery decision due to the extended period of uncertainty.

F. Until a Durable Cost Recovery Framework is Developed, SCE's Investors Require a Wildfire Risk ROE to Compensate for this Risk

In their 2013 test year applications, SCE and SDG&E cited the 2007 Southern California wildfire as an example of a catastrophic event resulting in a need to further compensate investors

[99] Assembly Bill (AB) 57 energy procurement process successfully restored confidence in the regulatory construct that was fractured during the Energy Crisis, by providing for Commission approved energy procurement plans with upfront, achievable standards and timely, robust reviews to ensure compliance with those approved plans.

[100] *See* R.19-01-006, *Southern California Edison Company Opening Comments on Order Instituting Rulemaking,* pp. 13-16 (February 11, 2019). EIX has described this standard in a letter to the Commission on Catastrophic Wildfire Cost and Recovery (April 1, 2019), available at: http://opr.ca.gov/docs/20190403-wildfire_comments_04-01-2019_Southern_California_Edison.pdf.

through a higher ROE because of the higher risk.[101] The Commission rejected those requests, because, paradoxically, the credit rating agencies had both failed to mention wildfire risk *and* were taking this risk into account.[102] The CPUC claimed that catastrophic events are not limited to California. Because none of the reports from credit rating agencies cited wildfire risk as a negative exposure, the Commission denied any upward adjustment to the financial modeling results on the ground that such adjustment would be "redundant and possibly excessive."[103]

As evident in recent years, wildfires – catastrophic megafires – *are* a unique risk for California as a result of extreme weather conditions, increased population density and development in the wildland-urban interface, and California's liability and cost recovery framework.[104] Moreover, credit rating agencies have extensively referenced the risks associated with wildfires and California's cost recovery framework as the primary reason for downgrading SCE's and the other California IOU's credit ratings and credit outlooks.

SCE engaged Frank Graves of the Brattle Group ("Brattle") to determine the ROE needed to compensate investors for this risk. In its report, which is included in Exhibit SCE-03, *California Megafires: Approaches for Risk Compensation and Financial Resiliency Against Extreme Events,* Mr. Graves describes the increased risk of severe wildfires in California, the damages and costs associated with these fires, and the asymmetric risk borne by utilities as a result of California's wildfires combined with inverse condemnation and CPUC cost recovery policies. Prior to engaging the Brattle Group, SCE had conducted a CPUC-required Risk Assessment and Mitigation Plan ("RAMP"), which was submitted in 2018. In the RAMP, SCE identified and evaluated its top safety risks, such as wildfires; evaluated

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[101] A.12-04-015, *Testimony Supporting Southern California Edison's Application For Authority To Establish Its Authorized Cost Of Capital For Utility Operations For 2013 And To Reset The Annual Cost Of Capital Adjustment Mechanism*, SCE Hearing Exhibit 17, p. 32; SDG&E Hearing Exhibit 3, p. 13.

[102] D.12-12-034, p. 30 (concluding that while "none of the credit agencies reporting on the creditworthiness of either SCE or SDG&E mentioned any risks associated with wildfires. . . [t]hese business risks are already captured in the parties' financial modeling results.").

[103] *Id.*

[104] *See* Kendra Pierre-Louis, *Why Does California Have So Many Wildfires*, New York Times (November 9, 2018), available at: https://www.nytimes.com/2018/11/09/climate/why-california-fires.html

opportunities to mitigate those risks; and proposed mitigation plans for the risks. Mr. Graves leveraged the RAMP study, updated with more recent wildfire information, and insurance industry benchmarks to estimate the maximum potential liability that SCE could be exposed to as a result of wildfires. He estimated this potential liability – its average worst case outcome across 100 10,000-fire-year simulations – to be approximately $12.6 billion (pre-tax) in excess of SCE's $1 billion of current insurance coverage. Mr. Graves, using that potential liability estimate along with the underlying statistical pattern of potential damages, then calculated that an additional $1 billion per year of net income would be required to bear these risks. Given SCE's requested rate base in the 2018 GRC, this increase in net income translates into an approximately 6.0% Wildfire Risk ROE.[105] SCE therefore recommends 6.0% as the appropriate increase to ROE to address wildfire risk.

Investors must have confidence that they have a reasonable opportunity to earn a return on their investment at a level that is commensurate with their risk. Given wildfire risks, the Base ROE returns must be supplemented based upon the worst case liability that equity holders could face. SCE relied upon the average worst case number and believes this is appropriate for several reasons. First, shareholders are currently exposed to the maximum liability – there is no cap on their liability under the current regulatory construct. Shareholders could lose all equity in the company if wildfire damages prove large enough. Second, as Mr. Graves explains, unlike traditional insurance providers, SCE cannot diversify its risk portfolio, which would have justified the use of the mean liability exposure level. Self-insurance requires a more conservative approach than diversified insurers. Mr. Graves analogizes to an individual saving for retirement – fiscal prudency requires that individual to save to the maximum life span, not an average one. Third, recent wildfires in 2018 show that damages from wildfires can rise to very large amounts, exceeding even the $12.6 billion net exposure calculated by Mr. Graves.

[105] *See* Exhibit SCE-03.

V.

CAPITAL STRUCTURE

A. Summary of SCE's Capital Structure Recommendation

This section discusses SCE's credit ratings, credit ratios, and recommended ratemaking capital structure for 2020 and provides information regarding debt equivalence, all as required by Ordering Paragraph 6 of D.04-12-047.[106] Based on its assessment of other utilities, SCE's credit ratios, current credit ratings and debt equivalence, SCE recommends the capital structure changes reflected in Figure V-7.

Figure V-7
SCE's Recommended Capital Structure[107]

Component	Current	Proposed
Long-Term Debt	43.0%	43.0%
Preferred Equity	9.0%	5.0%
Common Equity	48.0%	52.0%
Total	**100.0%**	**100.0%**

B. SCE's Current Credit Ratings and Outlook

1. SCE's Current and Projected Credit Ratings

As shown in Figure V-8, SCE's credit ratings from Moody's, S&P, and Fitch for its debt are at investment grade levels (BBB- or above), and the Company's preferred equity is below investment grade. All three ratings agencies presently list SCE's rating outlook at Negative or CreditWatch Negative.

[106] D.04-12-047, pp. 51-52, Ordering Paragraph 6.

[107] Per Advice Letter 3818-E, SCE will maintain its authorized levels over a 37-month period. Should SCE's capital structure be approved as requested, it will calculate the 37-month average compliance level using its currently authorized level of 48% common equity in months prior to January 2020, and the requested 52% in January 2020 and thereafter.

S&P and Moody's ratings are, for the most part, aligned. The Fitch ratings are one notch below those of S&P and Moody's, except that they rate senior secured debt in line with the other agencies. All three agencies have expressed concerns about SCE's credit quality going forward, noting weaknesses that could lead to a lower credit rating without continuing Commission support for credit quality. Additional information regarding S&P and Moody's ratings are discussed in this section, as these agencies remain the two primary sources of credit information used by investors and should be given more weight in assessing investors' perceptions of SCE's credit quality.

Figure V-8
SCE's Current Credit Ratings

Rating	Standard & Poor's	Moody's	Fitch
Corporate Credit Rating	BBB	Baa2	BBB-
First Mortgage Bonds	A-	A3	BBB+
Senior Unsecured Debt	BBB	Baa2	BBB
Preferred Stock	BB+	Ba1	BB+
Short-Term Debt	A-2	P-2	F3

SCE's current credit ratings, in relation to the overall ratings scale for each credit ratings agency, are also highlighted in Appendix A.

a) Standard & Poor's (S&P)

S&P considers separate scales for business and financial risks when determining a company's corporate credit rating.[108] SCE's business risk was reduced from "Excellent" to "Strong" in September 2018 due to California wildfires, and SCE remains in the "Significant" category for financial risk. The combination of these two positions supports the Company's corporate credit rating, which was downgraded in January 2019 to BBB, from the BBB+ level that existed at the time the 2013 cost of capital application was submitted in 2012. In Section VIII.B.1, SCE provides more detail on how SCE's business risk compares with historical levels and with other electric utility and non-utility benchmarks.

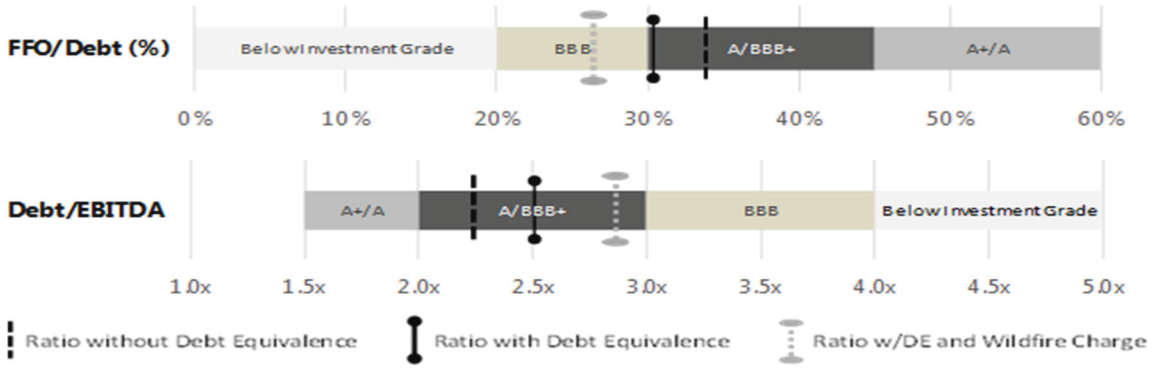
[108] S&P Business Risk scale: Excellent, Strong, Satisfactory, Fair, Weak, Vulnerable;
S&P Financial Risk scale: Minimal, Modest, Intermediate, Significant, Aggressive, Highly Leveraged

In January 2019, S&P also revised SCE's outlook from "Negative" to "CreditWatch Negative" as a result of the general weakening of California's regulatory compact because of unaddressed longer-term cost recovery risk from inverse condemnation with the CPUC's recent decision disallowing SDG&E's 2007 wildfire cost recovery.[109] Details regarding wildfire risk are explained in Section IV.A and many other risks that SCE faces are discussed in Section III. As a result there is good reason to believe that SCE may be further downgraded, below investment grade, in the near future.

The two primary credit ratios used by S&P to measure financial risk are 1) the ratio of funds from operations ("FFO") to total debt, and 2) total debt to earnings before interest, taxes, depreciation and amortization ("EBITDA"). SCE's current projections of its ratios for 2020 are shown in Figure V-9 in relation to the implied ratings position for each ratio. The projections are shown without Power Purchase Agreement ("PPA") debt equivalence, with PPA debt equivalence, and with PPA debt equivalence as well as a debt adjustment for the wildfire charge recorded by SCE in December 2018. The latter is included as it aligns with the credit ratio calculations within S&P's RatingsDirect for SCE's 2018 results.

[109] Press Release, Standard & Poor's, Edison International and Subsidiary Southern California Edison Downgraded to 'BBB'; Ratings Placed On Watch Negative (Jan. 21, 2019) available at: https://www.standardandpoors.com/en_US/web/guest/article/-/view/type/HTML/id/2155495. (Registration required for access.).

Figure V-9
2020 Projected SCE Credit Ratios and S&P Rating Placement[110]



b) Moody's

Moody's considers four general factors in its utility rating assessment with a different weighting for each.[111] The factors and weights are as follows:

- Regulatory Framework (25%)
- Ability to Recover Costs and Earn Returns (25%)
- Diversification (10%)
- Financial Strength and Liquidity (40%)

Moody's upgraded SCE to an A2 rating in 2014,[112] which was one notch above S&P's BBB+ rating at the time, noting a more favorable view of the relative credit supportiveness of the U.S. regulatory environment. However, Moody's changed EIX and SCE outlooks from "Stable" to

[110] Projected credit ratios in 2020 inclusive of proposed capital structure, return on equity and embedded cost of long-term debt and preferred equity; S&P's corporate rating for SCE, as of January 2019, is BBB with negative outlook.

[111] Moody's Investors Service, Rating Methodology, Regulated Electric and Gas Utilities (June 23, 2017) available at: https://www.moodys.com/research/Moodys-updates-its-methodology-for-rating-regulated-electric-and-gas--PR_368709 (registration required).

[112] Moody's Investors Service, Rating Action, Moody's upgrades Edison International to A3 from Baa2; Southern California Edison to A2 from A3 and to Prime-1 from Prime-2; rating outlooks stable (January 30, 2014), available at: https://www.moodys.com/research/Moodys-upgrades-Edison-International-to-A3-from-Baa2-Southern-California--PR_291608 (registration required).

"Negative" in April 2018,[113] stating that "SCE's credit profile is weighed down by the potentially large contingent exposure created by the application of strict liability standard in California in the case of wildfires where utility equipment was determined to be the source of the fire."[114] That report added that "[t]he increasing inverse condemnation risk exposure has caused us to reassess our view of the credit supportiveness of the regulatory environment in California."[115]

Then, as discussed in Section IV.D, in September 2018, Moody's downgraded SCE to A3 because Senate Bill 901 ("SB 901"), which was supposed to address cost recovery, failed to address inverse condemnation.[116] Thereafter, in December 2018, Moody's revised its outlook from "Stable" to "Negative".[117] On March 5, 2019, Moody's again downgraded Edison International's and SCE's ratings, this time downgrading SCE to Baa2 from A3. Moody's based this downgrade on "the potential for multi-billion dollar exposure related to wildfire risk that is unique to investor-owned utilities in California."[118] Moody's explained that California has unique wildfire risks because "wildfires are on average much more destructive because of its higher population density compared to other western states" and because of the doctrine of inverse condemnation, which "holds electric utilities to a

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[113] Moody's Investors Service, Rating Action: Moody's Changes Edison International and Southern California Edison's Rating Outlooks to Negative (April 11, 2018) available at: https://www.moodys.com/research/Moodys-Changes-Edison-International-and-Southern-California-Edisons-Rating-Outlooks--PR_380780 (registration required).

[114] *Id.* at p. 1. (quoting Toby Shea VP -- Sr. Credit Officer).

[115] *Id.*

[116] Moody's Investors Service, Rating Action, Moody's downgrades Southern California Edison to A3 from A2 and Edison International to Baa1 from A3; outlooks stable (September 6, 2018) available at: https://www.moodys.com/research/Moodys-downgrades-Southern-California-Edison-to-A3-from-A2-and--PR_388504 (registration required).

[117] Moody's Investors Service, Rating Action, Moody's revises the ratings outlook of Southern California Edison and Edison International to negative (December 3, 2018) available at: https://www.moodys.com/research/Moodys-revises-the-ratings-outlook-of-Southern-California-Edison-and--PR_392015.

[118] Moody's Investors Service, Rating Action: Moody's downgrades Edison International to Baa3 and Southern California Edison to Baa2; outlooks negative (March 5, 2019) available at: https://www.moodys.com/research/Moodys-downgrades-Edison-International-to-Baa3-and-Southern-California-Edison--PR_396014 (registration required).

strict liability standard on third-party property damages caused by the wildfire, regardless of fault" when utility equipment is a substantial cause of the wildfire. Moody's also referenced the "significant amount of uncertainty associated with the cost recovery process because in 2017 the CPUC disallowed the entire $379 million wildfire cost request for wildfires that occurred on San Diego Gas & Electric's territory in 2007."[119] Moody's noted that SCE's outlook can return to "Stable" if there are supportive legislation that would alleviate financial risk caused by wildfires, stating that an upgrade is possible if wildfire exposure on inverse condemnation policy is fully mitigated through regulatory, legislative, or judicial action. However, Moody's added that a downgrade of SCE is also possible if wildfire exposure is not further mitigated or if SCE's cumulative exposure continues to grow.

Aside from wildfire exposure, other credit challenges Moody's notes include the State's political risk, demanding public policy, and moderate carbon transition risk. California places high demand on its utilities, with ambitious public policy goals that are implemented through utility operations. Moody's notes that while these State mandates may be investment opportunities for utilities, they also expose utilities to the risk of cost recovery. These initiatives, such as the state's Renewables Portfolio Standard, also have a potential to impact retail rates and reliability negatively due to the substantial cost that is required for infrastructure upgrades. Moody's also notes that the need for battery storage, driven by the increasing supply of solar energy on the grid, may create further rate pressures due to the high costs of storage at this time. These risks are described in Section III.

According to a March 2019 report from Moody's, SCE's credit ratios – when adjusted to account for wildfire risks – are typical of utilities that are rated in the Baa category.[120] In March 2019, Moody's stated that "SCE has an average CFO to debt of 25.9% over the previous three

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[119] *Id.*

[120] Moody's Investors Service, Credit Opinion: Southern California Edison Company: Update following downgrade to Baa2 negative (March 13, 2019) available at: https://www.moodys.com/research/Southern-California-Edison-Company-Update-following-downgrade-to-Baa2-negative-Credit-Opinion--PBC_1163861 (subscription required).

years as of the end of December 2018. SCE is projected to generate a ratio of CFO pre-WC[121] to debt to be around 22%."[122] While assessing this level of Cash Flow to Debt in addition to the potential impacts of wildfire-related claims, Moody's further noted "As an indication of the potential impact on financial metrics, $2.5 billion of additional debt at SCE would drive its CFO pre-WC to debt to around 18% and $5 billion of additional debt would result in a CFO pre-WC to debt of around 16%. These CFO to debt ratios are typical of utilities that are rated in the Baa category."[123] This aligns with Moody's current assigned corporate rating of Baa2 for SCE.

SCE's projected credit ratios on Moody's Financial Strength scales, based on its proposed capital structure, ROE and embedded costs, are shown in Figure V-10. While these ratios appear supportive of improvements to SCE's credit ratings, these financial strength and liquidity figures support only 40% of the overall general factor weightings identified by Moody's and discussed earlier in this section. Moody's has noted that regulatory, legislative or judicial action mitigating the financial impact associated with wildfires remains a driving factor of any potential future favorable ratings action. In addition, Figure V-10 also includes data points showing the projected impacts from overlaying SCE's December 2018 wildfire charge onto its credit ratios.[124]

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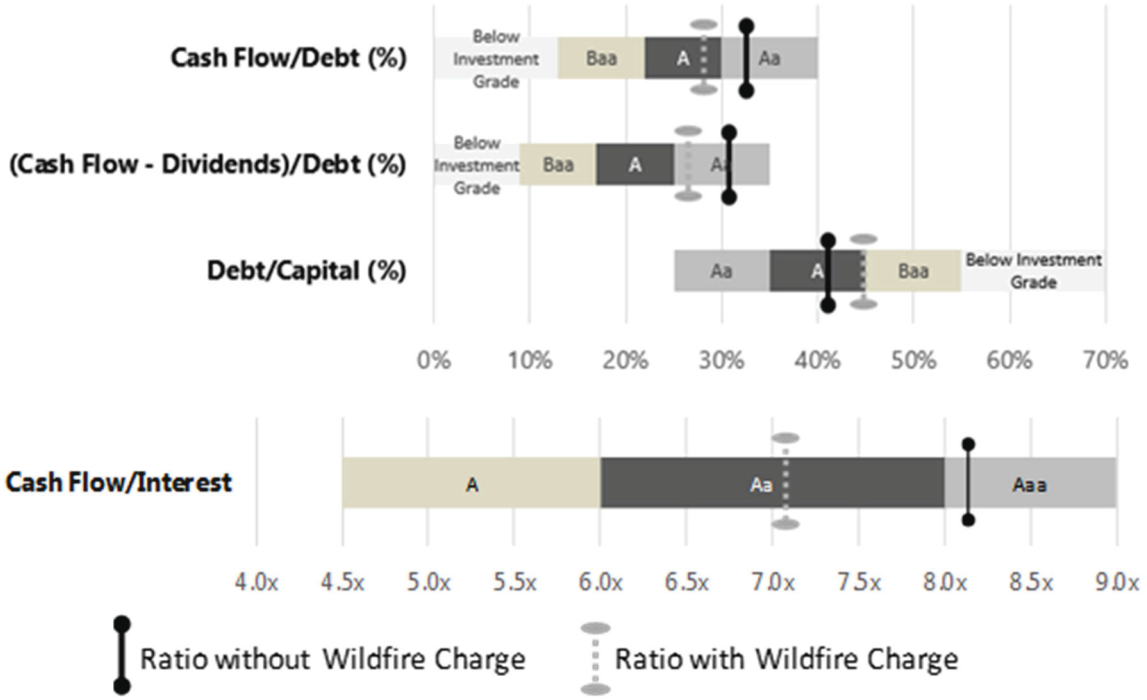
[121] CFO Pre-WC means cash from operations pre-working capital, referenced as Cash Flow/Debt in Figure V-10.

[122] Moody's Credit Opinion, *supra* note 120, p. 6.

[123] *Id.* p. 6.

[124] Moody's Investors Service, Rating Action: Moody's downgrades Edison International to Baa3 and Southern California Edison to Baa2; outlooks negative (March 5, 2019) available at: https://www.moodys.com/research/Moodys-downgrades-Edison-International-to-Baa3-and-Southern-California-Edison--PR_396014 (registration required).

Figure V-10
2020 Projected SCE Credit Ratios and Moody's Rating Placement[125]



2. The Impact of Credit Rating Downgrades on Borrowing Costs

The market disruptions of the energy crisis made clear the importance of creditworthiness for supporting both capital expenditures and power procurement. The credit rating agencies assess both the cash returns earned and the amount of equity capital invested when determining a utility's credit rating. For SCE to maintain an investment grade credit rating – the credit rating level needed to make SCE a comparably attractive investment vehicle to its utility peers – SCE's cash flow must meet certain thresholds for metrics monitored by the credit ratings agencies. These metrics primarily focus on SCE's cash flows as compared with debt levels or interest payments associated with debt. Because retained earnings are a significant component of cash flow, SCE's earned equity returns are a primary driver of credit metrics. Without adequate credit ratings, SCE would not be able to support its capital investment

[125] Projected credit ratios in 2020 inclusive of proposed capital structure, return on equity and embedded cost of long-term debt and preferred equity; Moody's corporate rating of SCE, as of March 2019, is Baa2 with negative outlook.

plans and long-term power purchases at competitive prices. Creditworthiness is also a prerequisite for participating in power procurement markets without onerous requirements to post collateral.

The downgrades in SCE's rating and outlook over the past year have increased SCE's borrowing costs, as SCE's embedded cost of long-term debt has increased. In March 2018, a month before Moody's first negative rating action in the year, SCE issued a low double A-rated 30-year secured bond at 4.125%. In March 2019, SCE issued a low single A-rated 30-year secured bond at a rate of 4.875%. While the 30-year Treasury bond yield decreased by 15 basis points between these two time periods, investors required an additional 90 basis points (i.e., a 90 basis point "spread") as compensation for purchasing SCE's lower rated debt. This higher spread will ultimately increase customer costs by approximately $200 million over the life of the bonds issued in March of 2019. Given SCE's extensive capital investment program and its ongoing need for new external financing, continued regulatory support for SCE's credit quality is critical to maintaining access to capital, which supports SCE's continued need to maintain and upgrade utility infrastructure and support California's public policy goals.

Avoiding further credit downgrades can save SCE's customers money. Barclay's provided an analysis showing additional data points regarding costs for 30-year debt.[126] When compared to costs for highly rated (AA) 30-year bonds, issuers with ratings of BBB typically paid approximately 60 to 90 basis points more than those issuing AA rated debt. However, issuers of non-investment grade debt, rated BB or B, paid approximately 265 to 590 basis points more than the issuers of highly-rated (AA) 30-year bonds. This three-to-tenfold increase raises the costs of financing utility investments and is thus costly to customers.

Moreover, as SCE's own credit history bears out, reversing a downgrade is typically not an instantaneous process, and SCE's customers would incur higher borrowing costs until the ratings agencies moved to restore SCE's ratings to prior levels. In 1992, S&P downgraded SCE

[126] Per average of Bloomberg Barclays Credit Index as of 3/26/2019 and Barclays data set of USD investment grade and high-yield new issue spreads from 2018 through 3/26/2019.

from Double-A ratings to Single-A ratings as a result of the Commission's failure to adjust SCE's equity ratio to counter the adverse effects of debt equivalence.[127] SCE has never regained Double-A ratings with these credit rating agencies. During the California energy crisis in January 2001, both agencies dropped SCE to non-investment grade ratings. Prior to the crisis, SCE had been rated in the Single-A category. SCE's senior secured debt regained a Single-A category rating with Moody's in August 2004, and a Single-A category rating with S&P in September 2007. SCE's other ratings (issuer credit rating and senior unsecured debt rating) from S&P have not regained the Single-A category since. Once a downgrade has been issued it can take years to reverse, with both investors and customers bearing the negative consequences.

C. Debt Equivalence

1. Debt Equivalence Explained and Impact on Capital Structure

Debt equivalence arises from long-term term financial commitments, such as the unfunded portion of post-retirement benefit obligations and long-term PPAs.[128] Wholesale power sellers rely on the purchasing utility's credit quality and its regulatory assurances of cost recovery when obtaining project financing. Project lenders look for a reliable source of cash flow from utility power purchasers in making funding decisions, and the terms and conditions of SCE's PPAs are in part driven by the seller's financing requirements. SCE's strong balance sheet and credit rating allow sellers to obtain project financing with lower borrowing costs, and SCE's customers receive the benefit when, through competitive procurement solicitations, these lower costs are passed through to them.

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[127] *See e.g.,* S&P Press Release (November 24, 1992) (downgrading SCE on CPUC's failure to acknowledge any credit risks associated with debt equivalence from power purchase contracts when determining cost of capital).

[128] *See* Maryam Ghadessi and Marzia Zafarn, *An Introduction to Debt Equivalence*, (August 4, 4017), available at: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPD_Work_Products_(2014_forward)/PPD%20-%20Intro%20to%20Debt%20Equivalency(1).pdf

Power sellers' reliance on SCE's balance sheet comes at a cost, however. The capacity payments included in SCE's PPA agreements are long-term fixed obligations that the rating agencies view as equivalent to debt. It is equity capital that provides the primary support to counter the debt equivalence created by power contracts. SCE has entered into extended power contracts including minimum payment commitments of over $34 billion to support resource adequacy and California's renewable energy goals.[129] These contracts add leverage to SCE's balance sheet and require an adequate equity base and a fair rate of return on equity to support and maintain that growing power contracts portfolio. Only with that proper equity support can SCE continue providing reliable service to its customers at reasonable rates.

Debt equivalence can have a significant effect on a utility's credit rating and cost of borrowing, as the CPUC's Policy & Planning Division has recognized:

> The financial risk resulting from a large portfolio of PPAs could lead to a credit rating downgrade. The weakened credit ratings, in turn, affect utilities' cost of debt and equity assessed by financial markets. Therefore PPAs or other types of debt equivalent obligations might affect a utility's overall cost of capital.[130]

And as noted above, SCE has been downgraded in the past due to this Commission's failure to take debt equivalence into account when assessing the cost of capital.[131]

Although all three rating agencies consider debt equivalence in their credit rating determinations, S&P has published the most detailed and quantitative debt equivalence methodology. S&P discounts a utility's capacity payment stream at an approximation of the utility's cost of debt and then multiplies the resulting net present value by a risk factor. S&P assigns each utility a risk factor based on its regulatory structure and its likelihood of recovering purchased power contract costs in rates. For SCE, S&P's current risk factor is 25%.[132] Even at a risk factor as low as 25%, debt equivalence from SCE's power contracts is expected to approach $2.8 billion in 2020.

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[129] SCE Form 10-K, dated February 28, 2019, page 27. Total of table entries for "Power purchase agreements" greater than one year in duration.

[130] *An Introduction to Debt Equivalence*, *supra* note 128, p. 5.

[131] S&P Press Release from 1992, *supra* note 127.

[132] *Id.*, p. 8.

Debt equivalence is added to the utility's balance sheet and S&P imputes additional interest expense on the income statement and in cash flow calculations, along with additional cash flow from imputed depreciation expense, to measure the impacts on the utility's credit ratios. The overall effect of debt equivalence is to make the utility's balance sheet more leveraged and to reduce the level of the utility's cash flow in credit rating calculations.

2. Current Debt Equivalence

SCE's past and projected debt equivalence is shown in Figure V-11 below.

Figure V-11
S&P Debt Equivalence Adjustments for PPAs[133]

Year	Estimated/Projected Debt equivalence
2017	$2,457 million
2018	$2,033 million
2019	$2,305 million
2020	$2,790 million

3. Impact of Coso Termination Agreement on Debt Equivalence

D.18-11-036 approved an agreement between SCE and Coso Geothermal Holdings, LLC ("Coso") to terminate two geothermal power purchase agreements prior to their current expiration dates ("Coso Termination Agreement"). As part of the decision, the Commission ordered SCE to include testimony in this 2020 Cost of Capital Application that addresses the beneficial impact of the Coso Termination Agreement on SCE's cost of borrowing, and include a proposal for applicable responsible customers to share in the beneficial impact of the Coso Termination Agreement on SCE's cost of borrowing.[134]

[133] *See* Standard & Poor's, "Southern California Edison," *RatingsDirect* (March 28, 2019) (for 2017 and 2018 data as reported by S&P). 2019 to 2020 data from internal SCE estimates based on S&P methodology.

[134] D.18-11-036, p. 26.

As SCE explained in comments on the proposed decision in A.18-03-010 that preceded D.18-11-036,[135] the earliest time that the beneficial impact can be shared with customers is 2020, with the cost of capital authorized by the Commission in this application. SCE's projected debt equivalence in Figure V-11 above includes the impact of the Coso Termination Agreements, as well as many other changes within SCE's portfolio of PPAs that create debt equivalence. It is SCE's total debt equivalence, across all of its PPAs, that affects its cost of capital. The beneficial impact of the Coso Termination Agreement is reflected in that total debt equivalence, as it is now lower than it would have been had the Coso contracts continued. In turn, that has a positive effect on SCE's cost of capital and customers will realize that benefit beginning in 2020.

D. Changes to Capital Structure Needed to Improve Financial Health

1. Preferred Equity

Preferred equity is a form of equity, but has features of debt in that it typically provides a fixed dividend payout, set by contract.[136] Rating agencies may adjust reported balance sheet financial equity and debt levels based on providing "equity credit" for preferred equity. SCE's preferred equity is typically given 50% "equity credit" by the credit rating agencies, with the remaining 50% viewed as debt. Common equity, on the other hand, is given 100% equity credit.

In the 2005 test year, SCE requested to mitigate the impacts of debt equivalence being imputed onto SCE's balance sheet by increasing its overall equity level via an increase in preferred equity capitalization, to 9%. Since that time, SCE's total rate base has grown from approximately $10 billion to a requested $29 billion in the 2018 GRC, requiring an increase of approximately $1.5 billion of preferred equity in order to maintain its 9% level. Through these increases, SCE's current preferred equity total of $2.2 billion has grown to represent almost one fifth of the total $13.4 billion of preferred

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[135] Opening Comments of Southern California Edison Company (U 338-E) on Proposed Decision, dated November 19, 2018, pp. 4-5, available at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M243/K013/243013788.PDF.

[136] *Introduction to Cost of Capital*, *supra* note 64, p. 5.

equity for United States IOUs.[137] This is reflective of the large amount of preferred equity that SCE owns, but also reflects the small amount of preferred equity used by U.S. IOUs and the fact that the market accessible to SCE, upon its downgrade below investment-grade levels, is reduced in size.

SCE's current 9% level of preferred equity makes it an outlier, as it is substantially larger than the 1.0-2.75% levels currently authorized for the other California Electric Utilities. As discussed in Section VIII.C.5, most other U.S. utilities sampled have preferred equity ratios of less than 1%. In addition, the total U.S.-wide proceeds of preferred equity raised by IOUs has recently averaged $1.2 billion,[138] and at SCE's current 9% level it would need to raise approximately $250 million of preferred equity each year, representing 20% of the U.S. IOU market. This outlier position is further complicated by SCE's recent downgrades to levels below investment grade, which will both reduce the number of market participants SCE can access and make it more costly for SCE to maintain its current authorized level of preferred equity.

These considerations combine to create a situation where SCE's current authorized preferred equity capitalization requires the company to pursue increasing levels of preferred equity in a market with a small amount of preferred equity used by U.S. IOUs and with a degrading credit proposition. As a result, SCE is proposing to reduce its preferred equity capitalization to 5% in 2020. By offsetting preferred equity with common equity, rather than incremental debt, SCE will maintain a layer of equity needed to mitigate imputed debt levels from its power contracts (i.e. debt equivalence) and can avoid the costs of maintaining an unusually-high preferred equity percentage in comparison to its utility peers.

2. Mitigating Credit Degradation with Preferred Equity Constraints

Avoiding further credit downgrades is necessary to prevent further cost increases for SCE's customers. SCE's preferred equity is now below investment grade, and its corporate and debt

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[137] Edison Electric Institute, *2017 Financial Review, Annual Report of the U.S. Investor-Owned Electric Utility Industry;* available at: http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/finreview/Documents/FinancialReview_2017.pdf

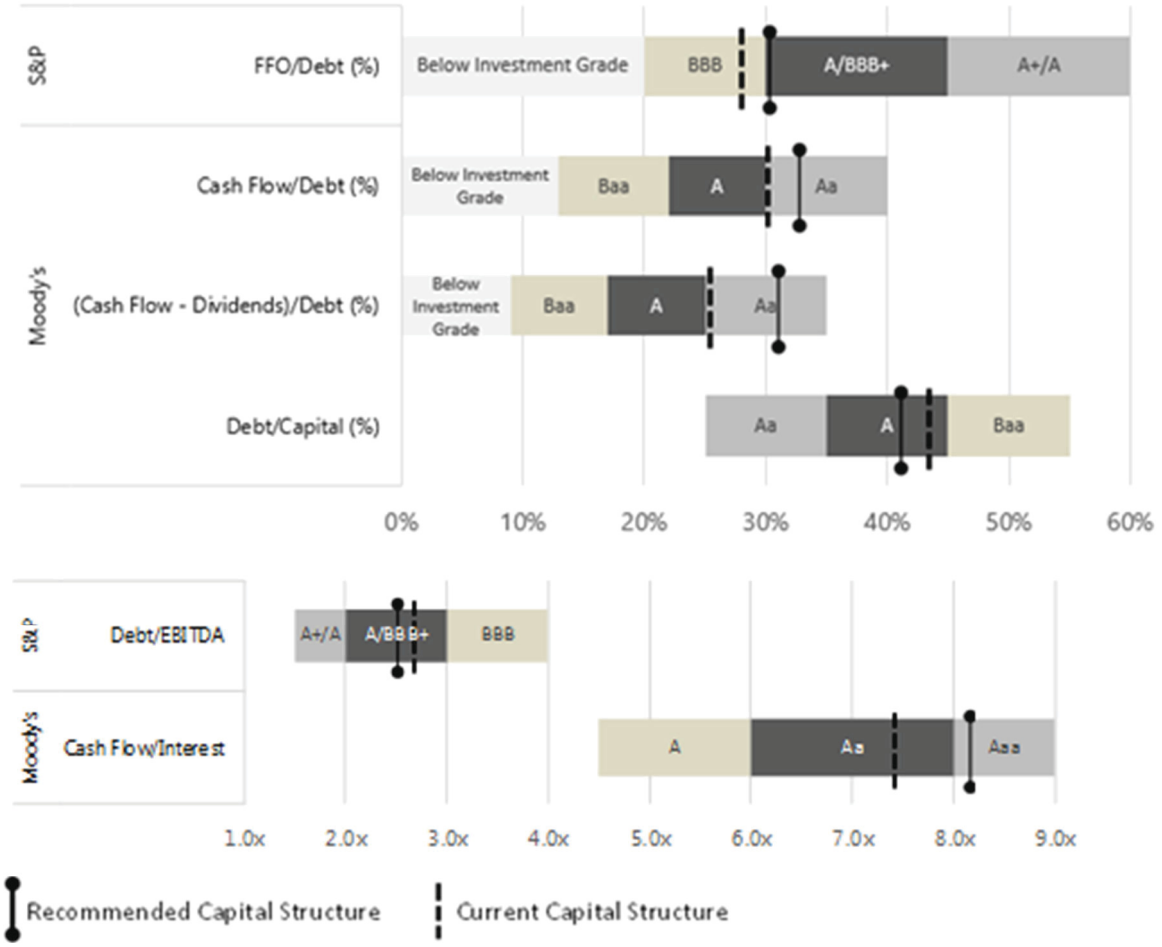
[138] *Id.*, p. 14.

ratings have been downgraded several times by all three major ratings agencies over the past year. Section V.B and VIII.C.1-3 describe SCE's current credit rating in detail. As was discussed in Section V.C.1, it may take years to reverse these recent downgrades.

SCE cannot replace its preferred equity with debt without eroding its credit metrics, as doing so would reduce cash flow and increase leverage. Thus, in order to maintain the cash flows and levels of leverage necessary to prevent degradation of SCE's credit ratios and to position the company for credit ratings that are needed to ensure consistent and cost-effective access to capital markets, SCE recommends increasing the common equity in its ratemaking capital structure to 52%.

SCE's projected credit metrics, for S&P and Moody's, with both the current authorized capital structure and recommended capital structure and without impacts from possible wildfire liabilities, are shown in Figure V-12. The increase in common equity reduces leverage and improves SCE's credit metrics to high quality grades that will better support the reduction of SCE's future borrowing costs. It should also be noted that, by themselves, the ratios support higher credit ratings than currently assigned to SCE. However, these credit metrics represent only a portion of the factors used by the agencies when assessing the credit ratings of an entity. The rating agencies are looking to the Commission to provide evidence of a supportive credit environment; approval of SCE's request for a higher common equity ratio will contribute to such evidence.

Figure V-12
2020 Projected SCE Credit Ratios,
Current vs. Recommended Capital Structure[139]



3. Benefits from Increasing SCE's Common Equity Ratio

SCE cannot guarantee that a rating improvement will result from increasing SCE's common equity level, because the rating agencies take many other factors into consideration in determining ratings. Other considerations, including regulatory uncertainty, may slow SCE's ratings progress. Nonetheless, the rating agencies will view the capital structure changes favorably from a credit perspective as the improved cash flow and lower fixed obligations from reduced preferred equity improve SCE's credit metrics.

[139] Projected credit ratios in 2020 inclusive of proposed return on equity and embedded cost of long-term debt and preferred equity; SCE's current corporate ratings are BBB (S&P) and Baa2 (Moody's)

At the very least, the capital structure changes will help prevent further declines in SCE's rating in the event of financial stress. Given SCE's current credit rating – two notches above non-investment grade per S&P and Moody's – an additional financial cushion is critical to maintaining its operations. The benefits to SCE from a credit ratings improvement are explained in detail below. While some benefits may be quantified, a number of other, equally important benefits cannot be easily measured. Furthermore, such benefits can only be gauged over the long-term, in times of both financial strength and weakness, and in times of strong and weak economies. All of these factors must be considered in judging whether to improve SCE's financial ratios by adding common equity.

4. Ability to Support Operations During Financial Stress

California's energy crisis provides a good illustration of what can happen to a utility under severe financial stress. When it became apparent that SCE would be unable to pay for its ongoing operations with the revenues it was receiving in rates, SCE lost all access to the financial markets and was unable to purchase power to serve its customers. State government was forced to take emergency measures, taking over the power-procurement process. During the crisis, SCE's strong Single-A credit rating was insufficient to allow the company to ride out the financial storm. However, it is worth noting that between September and December 2000, SCE was able to borrow approximately $2 billion in an attempt to maintain its operations prior to succumbing to default in early January 2001. In late September, SCE was able to increase its bank lines of credit by $200 million in a matter of days. As late as November, SCE was still able to access the capital markets, issuing $1.3 billion in bonds.[140]

SCE's current credit rating is precipitously close to not supporting the levels of borrowing that assisted SCE through the energy crisis. In addition, given SCE's default in 2001, the rating agencies cannot be expected to give SCE the benefit of the doubt. Because SCE's rating is already near the bottom of the investment grade level, it does not have far to fall before returning to non-investment grade status.

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[140] *See* SCE's SEC Form 8-K (November 3, 2000) available at: https://www.sec.gov/Archives/edgar/data/92103/000082705200000099/0000827052-00-000099.txt

In addition, the cost of borrowing as a non-investment grade company can be appreciably higher, as discussed in Section V.C.1. Interest rate differentials between ratings notches are relatively modest for companies with various investment grade ratings, but grow substantially as companies move down the ratings scale. Of equal concern is SCE's ability to access the financial markets on an ongoing basis with a non-investment grade credit rating. Many investors have investment guidelines that prevent them from lending to non-investment grade companies. Thus, not only is the non-investment grade market more expensive, but it may also limit the amount the company can borrow. The non-investment grade market is much more volatile – during times of economic stress, funds may not be available at any price, making it difficult to maintain operations, much less achieve important State policy objectives.

SCE's weak credit rating places it at greater risk for disruptions due to company-specific financial stress or stresses to the capital markets from economic conditions. Furthermore, SCE needs greater access to the capital markets now than during the energy crisis of 2000-2001. SCE expects to make significant capital expenditures in the next few years to improve grid resiliency, expand transportation electrification, and replace aging transmission and distribution infrastructure. In addition, SCE must be able to secure enough lines of credit so that it can ensure it has sufficient liquidity to support its day-to-day operations and to provide any collateral necessary on short notice to meet its power purchase contracts and other vendor counterparty requirements.

Based on the above discussion, SCE believes that it is prudent at this time to provide additional support to SCE's credit quality by increasing the amount of common equity in SCE's capital structure.

VI.

EMBEDDED COST OF LONG-TERM DEBT AND PREFERRED EQUITY

For 2020, SCE projects its embedded cost of long-term debt to be 4.74% and its embedded cost of preferred equity to be 5.70%. In accordance with long-standing practice, SCE requests that the Commission authorize these costs for 2020.

Details of SCE's projections of its embedded cost of long-term debt and preferred equity are found in Appendix B. SCE's estimates start with recorded embedded costs as of the end of February

2019 and then incorporate SCE's current projection of long-term debt and preferred equity issues to be issued through the end of 2020. Embedded costs for 2020 are estimated as the average of projected embedded cost at the beginning of 2020 and the end of 2020. Costs of each issue are based on projected rates for 30-year Treasury bonds plus specified adders and an adjustment for amortization of expected issuance expenses.

VII.

COST OF CAPITAL MECHANISM

A. History

D.08-05-035 established a three year cost of capital cycle and the CCM for SCE, which provides for possible adjustments in the intervening years based on fluctuations in interest rates. D.13-03-015 continued the CCM, setting a base benchmark index of 5.00% for SCE. D.16-02-019 modified D.13-03-015 to suspend the CCM for 2017.

SCE's CCM contains these features:

- The benchmark value of the index is set at the 12-month average of the Moody's bond yield as of the end of September in the test year of the cost of capital application (e.g., 2020 for this application).
- Each year at the end of September, the value of the 12-month average is compared to the benchmark value.
- If the difference between the two exceeds 100 basis points, or one percent,[141] SCE's return on equity is adjusted by one-half of the difference, SCE's embedded costs of debt and preferred equity are reset to the latest forecast values for the following year, and the current value of the index becomes the new benchmark value.

In addition, D.13-03-015 states that the utilities continue to have a right to file a cost of capital application outside of the CCM process upon an extraordinary or catastrophic event that materially impacts their respective cost of capital and/or capital structure and affects them differently than the overall financial markets.[142]

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[141] The +/- 100 basis point or +/- 1.0% range is often called the "deadband."

[142] D.13-03-015, p. 7.

B. Base ROE

SCE proposes that the CCM as determined in D.08-05-035 and continued in D.13-03-015 remain unchanged for the Base ROE. SCE's CCM for the Base ROE has worked well and the Commission should retain it for SCE. It has provided certainty for SCE's customers and investors and avoided the use of scarce Commission resources to litigate SCE's cost of capital annually.

As noted above, SCE's CCM is calibrated on the Moody's Baa long-term utility bond yield. SCE proposes to continue to use this index. SCE's issuer credit rating from Standard & Poor's is BBB and SCE's issuer credit rating from Moody's is Baa2.[143] Thus, the Baa utility group is the best peer group for measuring SCE-specific risk.

C. Long-Term Debt and Preferred Equity Costs

SCE proposes that the cost of long-term debt and preferred equity be reset – when the Base ROE is reset – to the latest forecast values for the following year.

D. Wildfire Risk ROE

SCE proposes that the CCM not apply to the Wildfire Risk ROE, because wildfire cost recovery risk is not tied to capital market conditions or macroeconomic changes.[144] SCE is optimistic that actions from the State government will repair the regulatory compact and resolve inverse condemnations in the next few years. The Wildfire Risk ROE would be subject to change upon SCE filing a new application, should SCE's wildfire cost recovery and liquidity risk materially change due to legislative or regulatory actions. If the Commission wants SCE to file an application to update the Wildfire Risk ROE, SCE requests a minimum of 90 days to fulfill such request.

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[143] *See* Appendix A.

[144] Over the longer term, economic growth in California will increase the population living in and the number of structures in the wildland-urban interface, but over a three-year cost of capital cycle, SCE believes that this can be ignored for the purposes of this mechanism.

VIII.

COMMISSION'S QUESTIONS FROM D.17-07-005

A. Introduction

SCE has not submitted a Cost of Capital Application since 2012 for the 2013 test year. This significant time lapse drove a request by the CPUC for a more in-depth review of cost of capital issues in support of this testimony.[145] In particular, the CPUC raised eight questions ("Commission Questions") for the IOUs to answer.[146] The purpose of the following responses is to help inform the Commission's consideration of cost of capital as it relates to measures of risk faced by SCE, California electric utilities, and other U.S. utilities as well as non-utility peers, where applicable.

As shown in responses to the Commission Questions herein, SCE's ratings for business, financial and regulatory risk have all declined since SCE's 2013 Cost of Capital case. SCE's business risk profile measures worse than 74% of these utilities and worse than the non-utility benchmark. SCE's financial risk has also declined precipitously; SCE ranked third lowest out of 62 non-California utility companies for financial risk and had the worst financial rating compared to the non-utility benchmark in 2018. Unsurprisingly, California IOUs, including SCE, have seen deteriorating regulatory risk ratings (which are now worse than most other states) due to the confluence of factors related to recent wildfires.

With respect to SCE's capital structure, SCE's percentage of preferred equity is high – 9% compared to an average of less than 1% across the country. SCE seeks to rectify this disparity. SCE's 48% authorized common equity ratio is lower than other utilities nationally and the other California IOUs, which have authorized levels of 52%. SCE's authorized ROE is higher than in most other states but on par with PG&E and SDG&E, reflecting a historical California ROE risk premium. California risk has only increased due to California's unique regulatory environment and risks related to California wildfires.

[145] D.17-07-005 p. 11.

[146] D.17-07-005 pp. 12-13.

B. Approach and Sources

1. Measures of Business, Financial, and Regulatory Risk

The Commission Questions require SCE to address risks since its 2013 cost of capital application as compared to other companies. In its discussion of company business, financial, and regulatory risks below, SCE relies on published Standard & Poor's Ratings Services ("S&P") assessments of those risks. Evaluations of company business, financial, and regulatory risk profiles, along with other factors, form the basis for S&P's approach to determining a company's credit ratings.[147] S&P's risk assessments can be found in various S&P publications, including sector-wide and individual company reports.

2. Development of Peer Groups for Comparison

To facilitate relevant and consistent comparisons, SCE has identified, and will repeatedly refer to, certain peer groups throughout its responses. These groups, and the bases for their formation, are described below:

a) California Electric Utilities

This group is comprised of the 3 largest California investor-owned electric utilities by service territory, including SCE.[148] SCE believes this set to be a representative peer group of California electric utilities because these companies, like SCE, 1) are subject to regulation by the CPUC and 2) have large service territories.

b) Other Electric Utilities

The "Other Electric Utilities" group represents comparable electric utilities in the U.S. Its members are comprised of the electric operating subsidiaries of the utilities identified in Dr. Villadsen's "Electric Utility Proxy Group."[149] There are 80 electric utility operating companies in the Other Electric Utilities group as opposed to the 28 parent companies in the Electric Utility Proxy

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147 *Corporate Methodology,* S&P Ratings Services, RatingsDirect, November 19 2013, available at: https://www.spratings.com/scenario-builder-portlet/pdfs/CorporateMethodology.pdf

148 The remaining utility operating companies belonging in this group are PG&E and San Diego Gas & Electric.

149 *See* Exhibit SCE-02 (Direct Testimony of Dr. Villadsen).

Group.[150] To construct this Other Electric Utilities group, SCE utilized the Regulated Energy Companies screener on Market Intelligence to filter for "Diversified" and "Electric" operating utilities, and pulled relevant data items such as operating company and parent company names, for these utilities. SCE then cross referenced parent company names with those in the Electric Utility Proxy Group to determine the operating subsidiaries of the Electric Utility Proxy Group.

c) Vertically Integrated and Non-vertically Integrated Companies

SCE further distinguishes vertically and non-vertically integrated companies in the Other Electric Utilities group by relying on data available for these companies in the S&P Market Intelligence platform that specify the nature of a utilities' operations. SCE classified utilities with generation, transmission and distribution activities to be "vertically integrated." Utilities engaged only in transmission and/or distribution are classified as "non-vertically integrated" for purposes of this testimony. SCE is classified as vertically-integrated because it owns some generation.

d) Water and Gas Utilities

The "Water and Gas Utilities" group represents a second set of companies that provide highly-regulated utility service in the U.S., in addition to the set of electric utilities described above. Its members comprise the water and natural gas companies identified in Dr. Villadsen's Other Highly Regulated Utilities ("OHRU") proxy group".[151] There are 11 water and gas companies in this group.[152] The OHRU companies share similar characteristics to electric utilities in that they are rate regulated by state utility commissions, serve customers through a network of assets, and rely on substantial capital to provide service; i.e., they are capital-intensive, as is SCE.

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[150] Analyses and charts in the subsequent sections below may not depict the full population of 80 companies from the Other Electric Utilities, due to data availability for these utilities.

[151] *See* Exhibit SCE-02 (Direct Testimony of Dr. Villadsen).

[152] Analyses and charts in the subsequent sections below may not depict the full population of 11 companies from the Water and Gas Utilities group, due to data availability for these utilities.

e) Non-Utility Benchmark

The Non-Utility Benchmark represents non-utility companies that are comparable to SCE. This peer group is comprised of the same companies developed by Dr. Villadsen in the Capital-Intensive Network Industry ("CINI") proxy group.[153] There are 16 companies in this group.[154] The CINI companies share similar characteristics to electric utilities in that they are capital-intensive and "rely on a buildout system of assets."[155] However, CINI companies have larger risk exposure than electric utilities and may be a more appropriate comparison to SCE given unique risks for California IOUs.[156]

C. SCE's Responses to Commission's Questions

1. How does the utility's level of business risk compare to other utilities nationally and to other California utilities, and to non-utility benchmarks? Include separate comparisons for vertically integrated and non-vertically integrated utilities. How has this level changed since the test year 2013 Cost of Capital application?

This Commission has defined "business risk" as risk pertaining to "new uncertainties resulting from competition and the economy" and explains that such risk "can be caused by a variety of events that include capital investments, electric procurement, and catastrophic events."[157]

S&P similarly describes a company's business risk profile as "the risk and return potential for a company in the markets in which it participates, the competitive climate within those markets (its industry risk), the country risk within those markets, and the competitive advantages and

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[153] *See* Exhibit SCE-02 (Direct Testimony of Dr. Villadsen).

[154] Analyses and charts in the subsequent sections below may not depict the full population of 16 companies from the Non-Utility Benchmark, due to data availability for these companies.

[155] *Id.*, p. 16.

[156] *Id.*, p. 16.

[157] D.12-12-034, p. 30.

disadvantages the company has within those markets (its competitive position)."[158] To evaluate a company's business risk, S&P combines separate assessments of competitive position, with industry and country risks.[159] S&P assigns one of six possible scores for business risk (listed in order of increasing risk): Excellent, Strong, Satisfactory, Fair, Weak, and Vulnerable.

In addressing the Commission's questions about company business risk, SCE relies on S&P's definitions for, and the results of its company evaluations of, such risks.

a) SCE's business risk has increased along with California Electric Utilities

Figure VIII-13 summarizes the 2012 and recent S&P business risk ratings for the companies in the California Electric Utilities group. In 2012, S&P evaluated all 3 utilities' business risk profiles as "Excellent."[160] By the end of 2018, the business risk ratings for California Electric Utilities had deteriorated. On September 5, 2018, S&P revised its business profile assessments for SCE, PG&E, and SDG&E downward, from "Excellent" to "Strong", citing a "general weakening of California's regulatory compact… because of the continued unaddressed longer-term risk from inverse condemnation."[161] On January 9, 2019, S&P further downgraded PG&E's business risk to "Fair" from "Strong", based on the "fundamental weakening in the company's ability to manage regulatory risk".[162]

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[158] *Corporate Methodology,* S&P Ratings Services, RatingsDirect (November 19 2013), available at: https://www.spratings.com/scenario-builder-portlet/pdfs/CorporateMethodology.pdf.

[159] S&P assesses regulatory risk as part of its evaluation of a utility's competitive position. See *Key Credit Factors for The Regulated Utilities Industry,* S&P Ratings Services, RatingsDirect, (November 19, 2013), available at: https://www.standardandpoors.com/en_US/web/guest/article/-/view/type/HTML/id/2189281.

[160] *Id.*

[161] *Research Update: Edison International And Subsidiary Ratings Affirmed, Outlook Remains Negative,* S&P Ratings Services, RatingsDirect, September 5, 2018.

[162] *PG&E Corp. And Subsidiary Downgraded To 'B' On Announced Board Review; Ratings Remain On CreditWatch Negative,* S&P Ratings Services, RatingsDirect, (January 7, 2019).

Figure VIII-13
Business Risk Ratings California Electric Utilities, 2012 vs. 2019

CA Electric Utility	Business Risk	
	2012	2019
Southern California Edison Company	*Excellent*	*Strong*
San Diego Gas & Electric Company	*Excellent*	*Strong*
Pacific Gas & Electric Company	*Strong*	*Fair*

b) SCE's business profile is riskier than most Other Electric Utilities and Water and Gas Utilities

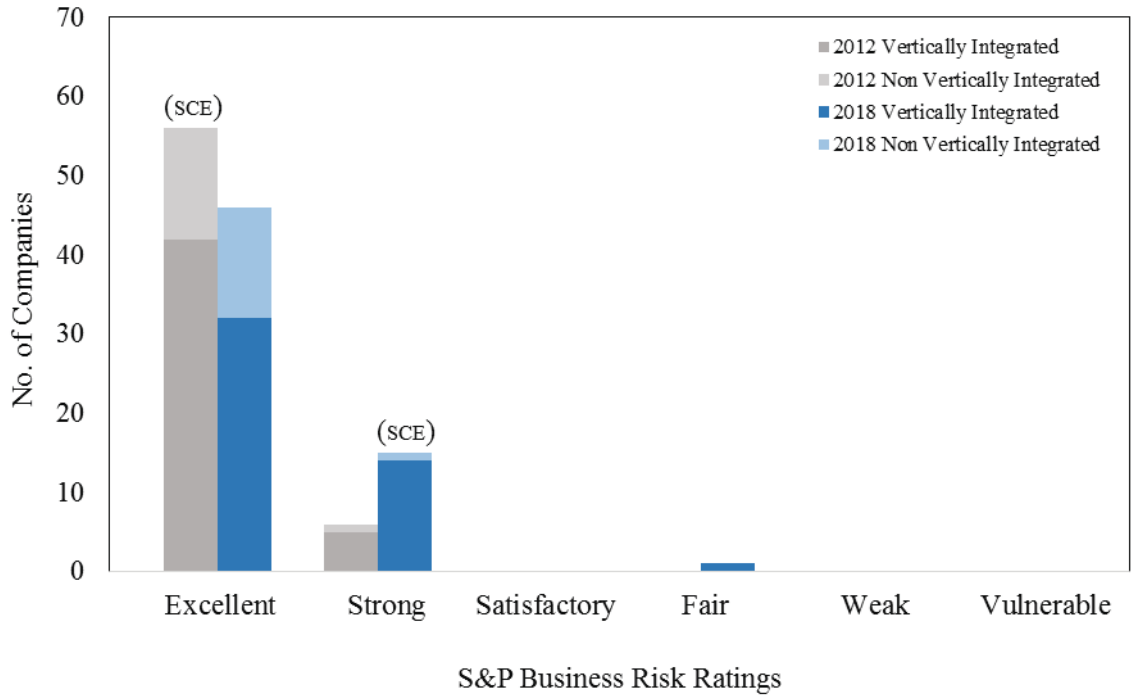
As discussed above, SCE's business risk is rated at "Strong" in 2018, a deterioration from its "Excellent" rating in 2012. Figure VIII-14 below charts the distribution of S&P's business risk ratings for the Other Electric Utilities group for the years 2012 and 2018, delineated by type of operations (i.e. vertically integrated vs. non-vertically integrated).[163] In 2012, 56 of the total 62 utilities in the peer group, or about 90%, were designated at the highest business risk rating of "Excellent," while the remaining 6 utilities scored in the next-highest "Strong" rating. This suggests that the Other Electric Utilities group collectively had very low business risk in 2012. In 2018, 46, or about 74% of the companies in the Other Electric Utilities remained at the "Excellent" business rating, while the remainder scored in the "Strong" category but for one utility.[164] Although the Other Electric Utilities saw a deterioration in business risk, and disproportionately so for the vertically integrated companies, overall the group collectively still has low business risk in 2018. Most notably, in 2018, SCE's business risk is worse than 74% of the companies in the Other Electric Utilities group. Further, we note that PG&E's business risk rating was Fair, just prior to filing bankruptcy, indicating that the "Weak" and "Vulnerable" ratings are rarely used. We can draw similar observations (although not depicted in Figure VIII-14) for the Water and Gas Utilities group for the years 2012 and 2018. All the companies in

[163] Chart reflects PG&E's revised business risk rating from January 9, 2019.

[164] PG&E's business risk rating fell to "Fair" from "Excellent".

the Water and Gas Utilities group had a business risk rating of "Excellent" that did not change between 2012 and 2018, while SCE business risk deteriorated from its "Excellent" rating in 2012 to "Strong" in 2018.

Figure VIII-14
Distribution of Business Risk Ratings for Other Electric Utilities, 2012 vs. 2018



c) SCE's business risk has increased relative to the Non-Utility Benchmark

SCE's business risk is rated at "Strong" in 2018, a deterioration from its "Excellent" rating in 2012. Figure VIII-15 below charts the distribution of S&P's business ratings for companies comprising the Non-Utility Benchmark. From 2012 to 2018, all 14 companies in the Non-Utility Benchmark either retained the same business profile rating or saw an improvement, or *decrease,* in risk. Specifically, 8 companies remained in the business risk profile rating of "Excellent", "Strong", or "Satisfactory", while 6 companies rated "Weak" or "Satisfactory" saw an improvement. SCE's business risk on the other hand, *increased* from 2012-2018.

Figure VIII-15
Distribution of Business Risk Ratings for Non-Utility Benchmark, 2012 vs. 2018

2. How does the utility's level of financial risk compare to other utilities nationally, to other California utilities, and to non-utility benchmarks? Include separate comparisons for vertically integrated and non-vertically integrated utilities. How has this level changed since the test year 2013 Cost of Capital application?

This Commission has explained that "[f]inancial risk is tied to the utility's capital structure. The proportion of its debt to permanent capital determines the level of financial risk that aa utility faces. As a utility's debt ratio increases, a higher return on equity may be needed to compensate for that increased risk."[165]

[165] D.12-12-034, p. 29.

S&P more broadly describes a firm's financial risk profile as the outcome "…of decisions about the manner in which management seeks funding for the company and how it constructs its balance sheet," and that financial risk "reflects the relationship of the cash flows the organization can achieve, given its business risk profile, to the company's financial obligations."[166] S&P primarily assesses a variety of credit ratios, including Total Debt to Total Capitalization, Cash Flow to Average Debt and Cash Flow Interest Coverage, in determining a firm's financial risk profile.[167] S&P rates a company's financial risk on a six point scale (from lowest to highest financial risk): Minimal, Modest, Intermediate, Significant, Aggressive, and Highly Leveraged.

In addressing the Commission Questions about company financial risk, SCE relies on S&P's definitions and results of its company evaluations of such risks.

a) SCE's financial risk has remained stable among California Electric Utilities

Figure VIII-16 below summarizes S&P's financial risk ratings for the California Electric Utilities in 2012 and recent ratings. SCE's financial risk has remained at "Significant" since the 2013 application, while both PG&E and SDG&E saw a deterioration in financial risk to "Aggressive" and "Significant", respectively. On October 30, 2015, S&P revised its financial risk assessment downward for SDG&E to "Significant" from "Intermediate" due to elevated debt levels arising from large capital-spending projects.[168] On January 7, 2019, S&P revised PG&E's financial risk downward to "Aggressive" from "Significant," citing difficulties with managing regulatory risk.[169]

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[166] *Corporate Methodology,* S&P Ratings Services, RatingsDirect, p. 1 (November 19, 2013) available at: https://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/8314109 (registration required).

[167] *Id.* at 28.

[168] *Research Update: Sempra Energy And Subsidiaries Ratings Affirmed; Business Risk Profile Revised To "Excellent" From "Strong",* S&P Ratings Services, RatingsDirect, p.3 (October 30, 2015); see also NA Corporate Rating Component Scores, pp. 44-45 available at https://www.spratings.com/documents/20184/0/ComponentScoresReportNA1H2018.pdf/15a7a52e-ebae-4f90-b3da-2ab12f3c8a35

[169] *Research Update: PG&E Corp. And Subsidiary Downgraded To 'B' On Announced Board Review; Ratings Remain On CreditWatch Negative",* S&P Ratings Services, RatingsDirect, p.3 (January 7, 2019).

Figure VIII-16
Financial Risk Ratings for California Electric Utilities, 2012 vs. 2019

CA Electric Utility	Financial Risk	
	2012	2019
Southern California Edison Company	*Significant*	*Significant*
San Diego Gas & Electric Company	*Intermediate*	*Significant*
Pacific Gas & Electric Company	*Significant*	*Aggressive*

b) SCE's financial risk increased relative to the Other Electric Utilities and Water and Gas Utilities

Figure VIII-17 below charts the distribution of S&P's financial risk ratings of 62 companies in the Other Electric Utilities proxy for years 2012 and 2018, further delineated by vertically and non-vertically integrated companies. In 2012, SCE's financial risk was approximately average relative to the Other Electric Utilities, but in 2018, SCE had since become financially riskier relative to the Other Electric Utilities group, with only 2 of the 62 companies with more significant financial risk. The Other Electric Utilities group saw improvement in financial risk, and therefore SCE's relative position deteriorated. In 2012, there were 30 companies that were financially riskier than SCE. The Water and Gas Utilities also saw improvement in financial risk over the period. Figure VIII-18 below charts the distribution of S&P's financial risk ratings of 11 companies in the Water and Gas Utilities group.

Figure VIII-17
Distribution of Financial Risk Ratings for Other Electric Utilities, 2012 vs. 2018

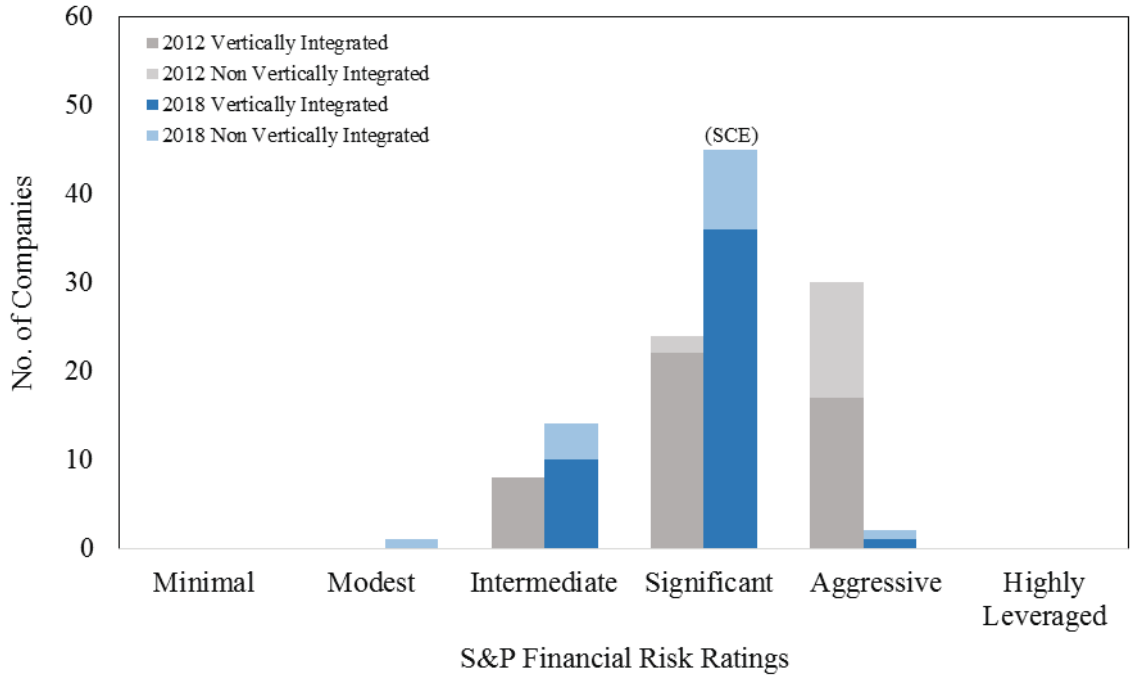
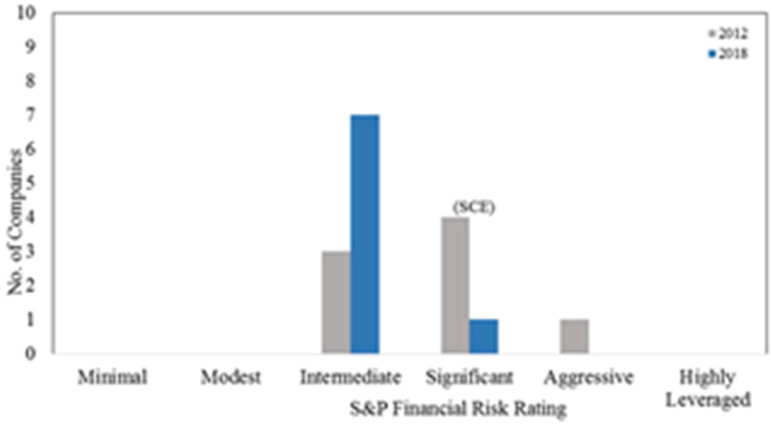


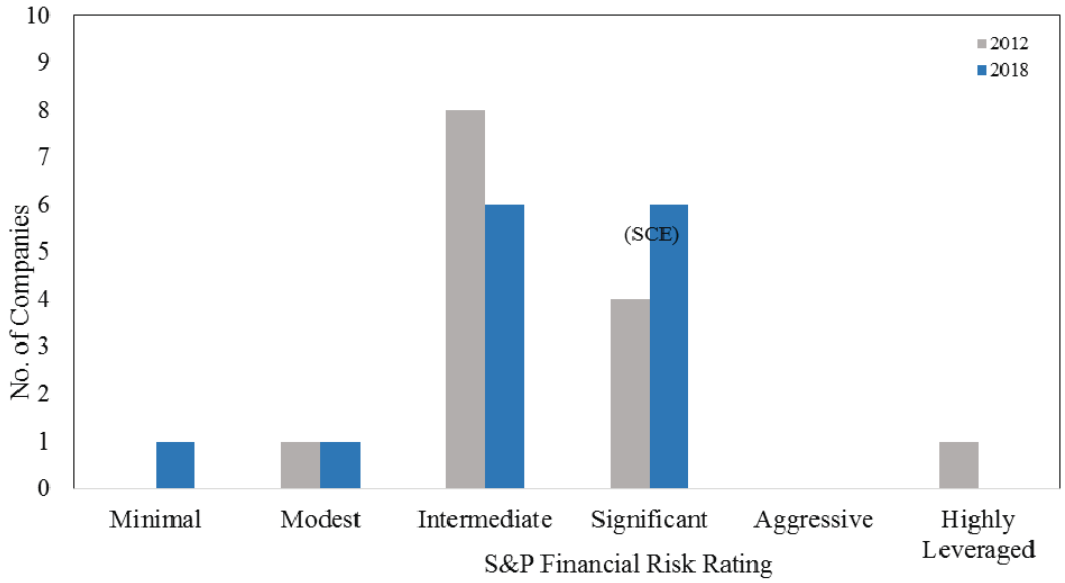
Figure VIII-18
Distribution of Financial Risk Ratings for Water and Gas Utilities, 2012 vs. 2018



c) SCE's financial risk increased relative to Non-Utility Benchmark

Figure VIII-19 below charts the distribution of S&P's financial risk ratings for 14 companies in the Non-Utility Benchmark. In both 2012 and 2018, SCE has remained one of the financially-riskier companies of the group. From 2012 to 2018, 9 of the companies in the Non-Utility Benchmark either retained the same financial risk rating or saw an improvement, or *decrease,* in risk, while 5 companies saw a deterioration. In 2018, no company in the Non-Utility Benchmark had a worse financial risk rating than SCE.

Figure VIII-19
Distribution of Financial Risk Ratings for Non-Utility Benchmark, 2012 vs. 2018



3. How does the utility's level of regulatory risk compare to other utilities nationally, to other California utilities, and to non-utility benchmarks? Include separate comparisons for vertically integrated and non-vertically integrated utilities. How has this level changed since the test year 2013 Cost of Capital application?

This Commission has explained that "regulatory risk" pertains to new risks that investors may face from future regulatory actions that the CPUC and other regulatory agencies might take.[170] S&P more specifically, but consistently describes a firm's regulatory risk profile as the relative credit supportiveness of a regulatory jurisdiction based on an assessment of its regulatory stability, efficiency of tariff setting procedures, financial stability, and regulatory independence to protect a utility's credit quality and its ability to recover its costs and earn a timely return.[171]

[170] D.12-12-034, *Decision On Test Year 2013 Cost Of Capital For The Major Energy Utilities*, p.31 (December 20, 2012).

[171] S&P Utilities: Key Credit Factors For The Regulated Utilities Industry, *supra,* note 159.

S&P rates regulatory risk by U.S. jurisdiction based on the following scale: Credit Supportive, More Credit Supportive, Very Credit Supportive, Highly Credit Supportive, and Most Credit Supportive. All five categories are generally characterized as at least somewhat "Credit Supportive" based on S&P's rationale that "all utility regulation sustains credit quality when compared to the rest of corporate and infrastructure ratings. The presence of regulators reduces business risk and generally supports utility ratings."[172]

In addressing the Commission Questions about regulatory risk, SCE relies on S&P's definitions and results of its regulatory jurisdiction assessments of such risks. Additionally, in Section III.E.2, SCE shows that, based on its own data and data from the Edison Electric Institute, SCE's GRC regulatory lag is well above historical levels and the national average. Further in Section VIII.C.8, SCE explains that based on a recent Morgan Stanley survey, investors view regulatory decisions as key to determining whether California utilities are investable.

Figure VIII-20 below summarizes the regulatory risk profiles of the U.S. Jurisdictions for 2018.[173]

[172] *U.S. And Canadian Regulatory Jurisdictions Continue To Bolster Utilities' Credit Quality*, S&P Global Ratings (October 30, 2018).

[173] *Id.* at 2.

Figure VIII-20
Regulatory Risk Profile of U.S. Jurisdictions, 2018

Most credit supportive	Highly credit supportive	Very credit supportive	More credit supportive	Credit supportive
Alabama	Arkansas	Alaska	Arizona	Hawaii
Colorado	Georgia	Connecticut	California	Mississippi
Florida	Indiana	Delaware	District of Columbia	New Mexico
Iowa	Kansas	Idaho	Maryland	
Kentucky	Louisiana	Illinois	Montana	
Michigan	Maine	Missouri	New Jersey	
North Carolina	Massachusetts	Nebraska	Oklahoma	
Wisconsin	Minnesota	Nevada	South Carolina	
	New Hampshire	New York	Washington	
	North Dakota	Ohio		
	Oregon	Rhode Island		
	Pennsylvania	South Dakota		
	Tennessee	Texas		
	Utah	Vermont		
	Virginia	West Virginia		
	Wyoming			

a) California's regulatory risk has increased

On June 25, 2018, S&P downgraded the regulatory risk profile of California from "Highly Credit Supportive" to "More Credit Supportive," which is the second lowest of five assessment ranks. S&P explained:

> Regarding these wildfires, California's inverse condemnation rule could impose liability on California utilities for wildfire damages involving their equipment even without a determination of negligence. PG&E, and potentially other utilities in the future, could be held responsible for billions of dollars because of inverse condemnation with recovery of these costs not clarified. California regulators ruled in November 2017 in a Sempra Energy subsidiary San Diego Gas & Electric Co. case that it cannot permit rate recovery of costs that were the result of imprudence or negligence by the utility even though in legal proceedings an inverse condemnation determination had been found. The inability to recover through rates the wildfire costs in excess of insurance proceeds is not credit supportive.[174]

[174] *U.S. And Canadian Regulatory Jurisdictions Support Utilities' Credit Quality--But Some More So Than Others*, S&P Global Ratings (June 25, 2018).

S&P's concerns were valid. Less than a year after the S&P report was published, SCE announced that it expects to incur a material loss in connection with the 2017/2018 wildfire and mudslide events and has accrued a charge of $4.7 billion in 2018.[175] Likewise, PG&E recorded a $10.5 billion charge related to 2018 Camp Fire and additional $1.0 billion charge related to 2017 Northern California wildfires.[176] In the past, credit rating agencies have upgraded utility ratings "on the basis of improving regulatory trends, better cost recovery measures, shorter regulatory lag, and more favorable regulator-utility relationships."[177] All of these factors have become less favorable in California over the past few years, due to inverse condemnation and other factors discussed in Section IV.

Furthermore, S&P has warned that, with the approaching 2019 summer California wildfire season, S&P would lower the ratings on Edison, SCE, and SDG&E by one or more notches if there is no "clear evidence that concrete steps are being taken…to strengthen California's regulatory construct for electric utilities."[178] On January 21st, 2019, S&P stated that its downgrade of SDG&E reflected the agency's continuing reassessment of California's regulatory construct for electric utilities following the announcement by PG&E that it expects to file for reorganization under Chapter 11 in U.S. Bankruptcy Court.[179]

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[175] SCE Form 10-k, Annual Report for the fiscal year ended December 31, 2018, P. 35. The $4.7 billion is before FERC and insurance recoveries and taxes; the net charge to earnings recorded was $1.8 billion.

[176] PG&E Form 10-k, Annual Report for the fiscal year ended December 31, 2018, p. 169.

[177] Holt, Lynn, *U.S. Electric Utility Creditworthiness--Why the Regulatory Framework Matters,* p. 2-3 (February 9, 2016), available at: https://bear.warrington.ufl.edu/centers/purc/docs//papers/1602_Holt_Electric_Utility_Creditworthiness.pdf.

[178] "Will California Still Have an Investment-Grade Investor-Owned Electric Utility?", S&P Global Ratings, Ratings Direct (February 19, 2019) available at: https://www.capitaliq.com/CIQDotNet/CreditResearch/RenderArticle.aspx?articleId=2168627&SctArtId=467165&from=CM&nsl_code=LIME&sourceObjectId=10866063&sourceRevId=14&fee_ind=N&exp_date=20290218-21:25:39.

[179] Usman Kahlid, S&P Global Market Intelligence: *S&P downgrades SDG&E, SoCalEd, Edison International on Wildfire, Climate Risk* (January 22, 2019) available at: https://www.spglobal.com/marketintelligence/en/news-insights/trending/NaiINRvWoP7CkJgiOoSjIQ2.

b) California is a higher risk regulatory environment compared to other states

Compared to 2012, California's regulatory assessment ranking is lower relative to other jurisdictions in the U.S. Although S&P has modified its five regulatory scoring levels since 2012, California was in the top 20% of the jurisdictions assessed in 2012 (*see* Figure VIII-22)[180] compared to the bottom 15% of jurisdictions assessed in 2018 (*see* Figure VIII-21), indicating California has a higher risk regulatory environment than most other states.

[180] *Standard & Poor's Revises Its U.S. Utility Regulatory Assessments*, S&P Global Ratings, Ratings Direct (December 28, 2012).

Figure VIII-21
Distribution of Regulatory Risk Profile, 2018

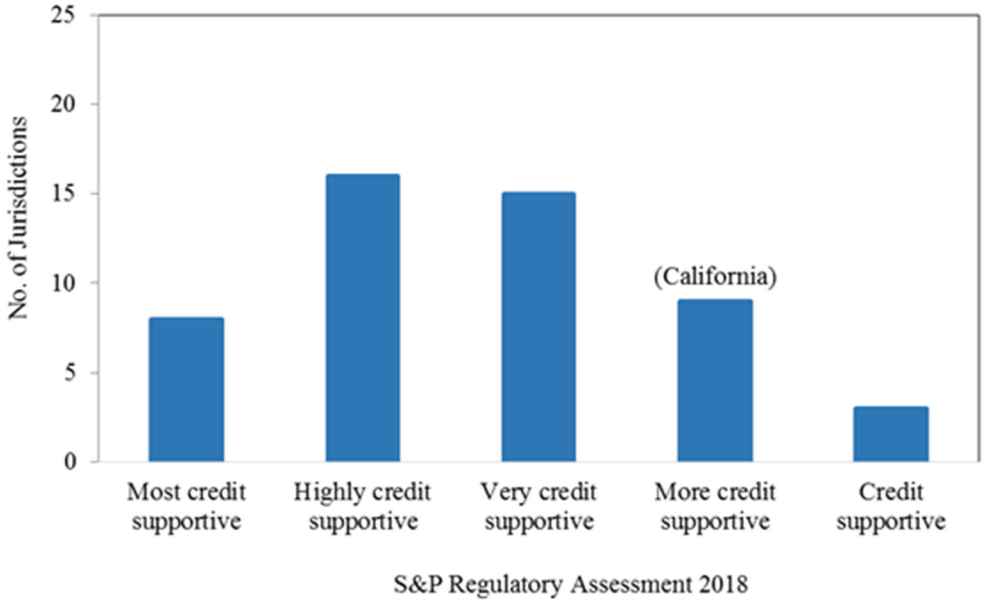
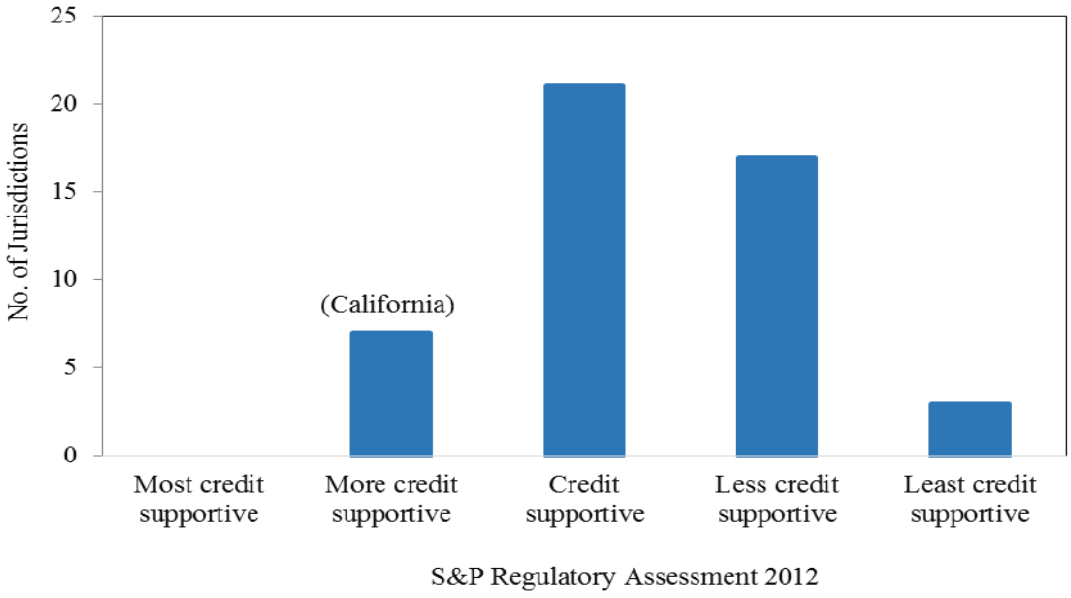


Figure VIII-22
Distribution of Regulatory Risk Profile, 2012



4. How has the utility's recorded capital structure changed since the 2013 Cost of Capital application? How has the recorded capital structure compared to authorized capital structure over this time period?

SCE's current authorized capital structure is 48% common equity, 9% preferred equity, and 43% long-term debt. In the time since the 2013 Cost of Capital application, the recorded ratios have remained relatively constant overall, with some variability in debt and common equity in the 2015-2018 timeframe. SCE's average recorded regulatory capital structure over the 74-month period beginning January 2013 through February 2019 is 49.5% common equity, 8.9% preferred equity, and 41.7% long-term debt.[181] The ratemaking capital structure excludes the $1.8 billion after tax wildfire-related charge that SCE recorded in December 2018[182] as well as the $448 million after-tax charge resulting from the implementation of the Revised SONGS settlement, as allowed under the agreement.[183] The recorded preferred equity ratio has been trending downward since 2016, which is driven by the limited depth of the preferred equity market, as discussed in more detail in Section V of this testimony. Figure VIII-23 below shows the recorded capital structure compared to authorized for the 2013 through February 2019 timeframe.

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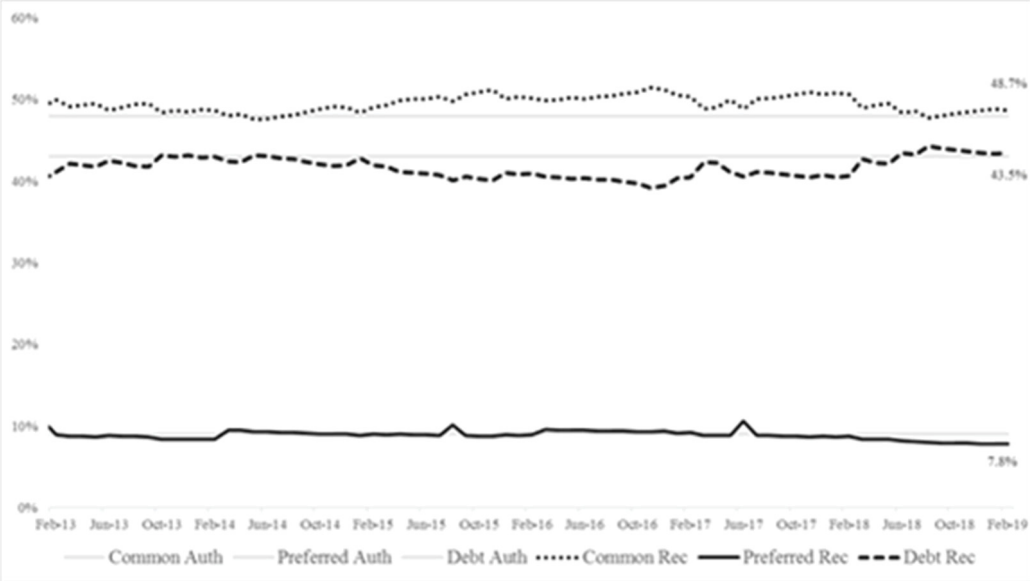
[181] Per recorded capital ratios data gathered from SCE internal reporting and tracked from January 2013 to February 2019. Inclusive of December 2018 wildfire-related charges, SCE's average recorded regulatory capital structure over the 74-month period beginning January 2013 through February 2019 is 49.3% common equity, 8.9% preferred equity, and 41.8% long-term debt.

[182] *See supra*, note 1.

[183] A.19-02-017, *Application of Southern California Edison Company for Approval of Waiver of Capital Structure Rule* (February 28, 2019).

Figure VIII-23
SCE Recorded vs. Authorized Capital Ratios, 2013 – February 2019



5. How does the utility's current capital structure compare to other utilities nationally and to other California utilities? Include separate comparisons for vertically integrated and non-vertically integrated utilities.

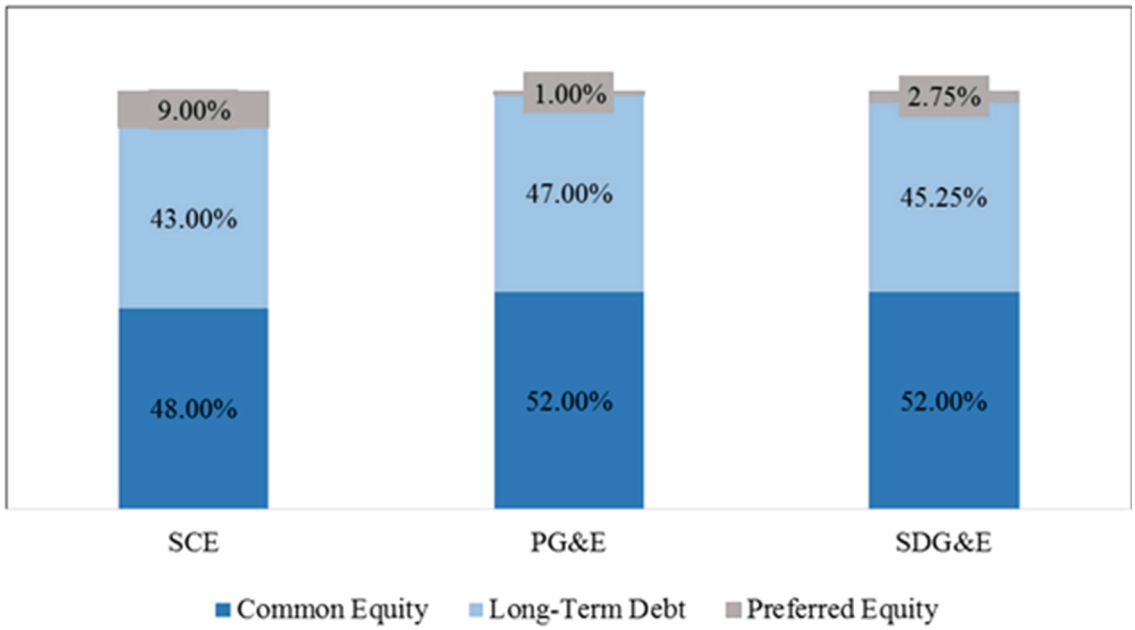
SCE's authorized capital structure currently consists of 48% common equity, 43% long-term debt, and 9% preferred equity. In this application, SCE is seeking an increase to its authorized common equity ratio from 48% to 52% while reducing its preferred equity ratio from 9% to 5% in its capital structure. Please refer to Section V for a detailed discussion on SCE's capital structure request.

a) SCE has significantly higher preferred equity in its authorized capital structure compared to the other California Electric Utilities

Figure VIII-24 compares SCE's currently authorized capital structure to those of the California Electric Utilities. Information for the California Electric Utilities' authorized capital structure was obtained from the each of the companies' SEC filings. The most notable difference between SCE's capital structure and other California Electric Utilities is the higher percentage of authorized preferred equity in SCE's current structure. SCE's current 9% level is much higher than the

1.0-2.75% levels held the other California Electric Utilities. Additionally, as shown in Figure VIII-23 above, SCE's common equity is much lower than SDG&E or PG&E, which have authorized levels at 52%.

Figure VIII-24
Authorized Capital Structure for California Electric Utilities



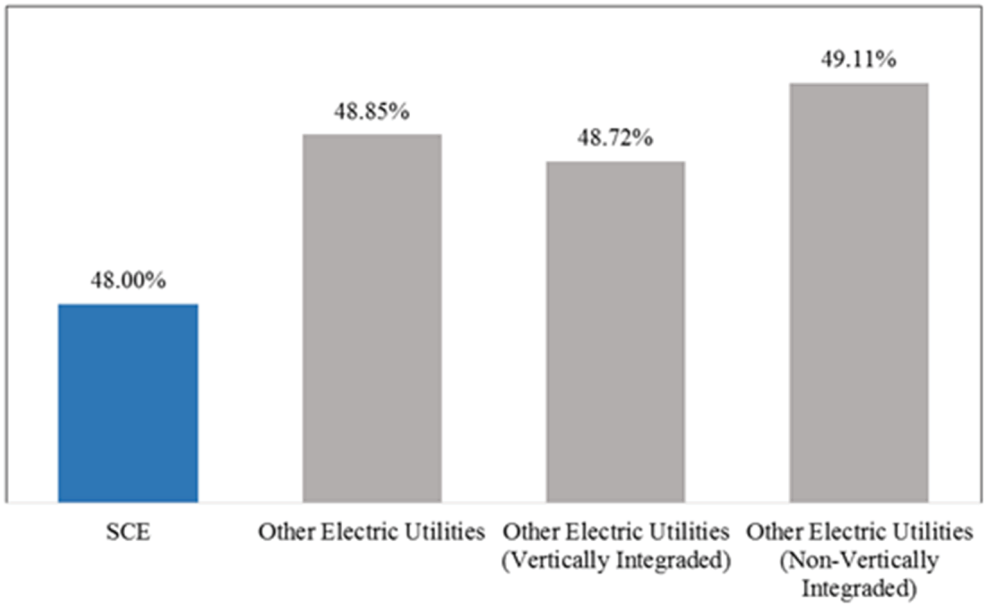
b) SCE's authorized equity ratio is lower compared to Other Electric Utilities and Water and Gas Utilities

Figure VIII-25 compares SCE's currently authorized common equity ratio to the authorized common equity ratios of Other Electric Utilities.[184] SCE's authorized common equity percentage is lower than the Other Electric Utilities group. As noted, the source of authorized capital structure did not include the authorized components for debt or preferred equity. As a proxy, SCE

[184] SCE downloaded Authorized Return on Equity and Authorized Common Equity ratio information for the companies in the Other Electric Utility group from the Utility Rate Case Screener on the S&P Market Intelligence online platform. The data in S&P Market Intelligence on Authorized Capital Structure was limited to Authorized Common Equity Ratio.

compared the capital structure from the financial statements of the companies in the Other Electric Utilities group.[185] As shown in Figure VIII-26, SCE's preferred equity component of 9% is significantly higher than the less than 1% average for Other Electric Utilities. The data on authorized capital structure for the Water and Gas Utilities group was limited. As a proxy, SCE compared the capital structure from the financial statements of the companies in the Water and Gas Utilities group[186]. As shown in Figure VIII-26, SCE's preferred equity component of 9% is significantly higher than the less than 1% average for Water and Gas Utilities.

Figure VIII-25
Authorized Common Equity Ratio, SCE vs. Other Electric Utilities



[185] Recorded capitalization information for companies in the Other Electric Utilities group was obtained from Bloomberg. Where available, SCE relied on latest available Bloomberg published data, either 12/31/2018 or 9/30/2018.

[186] Recorded capitalization information for companies in the Water and Gas Utility group was obtained from Bloomberg. Where available, SCE relied on latest available Bloomberg published data, either 12/31/2018 or 9/30/2018.

Figure VIII-26
SCE Authorized Capital Structure vs. Reported Capital Structure, Other Electric Utilities[187] and Water and Gas Utilities

	SCE Authorized	Other Electric Utilities 2018 Average	Gas & Water Utilities 2018 Average
Long-Term Debt	*43.00%*	*47.34%*	*45.87%*
Preferred Equity	*9.00%*	*0.19%*	*0.67%*
Common Equity	*48.00%*	*52.48%*	*53.45%*

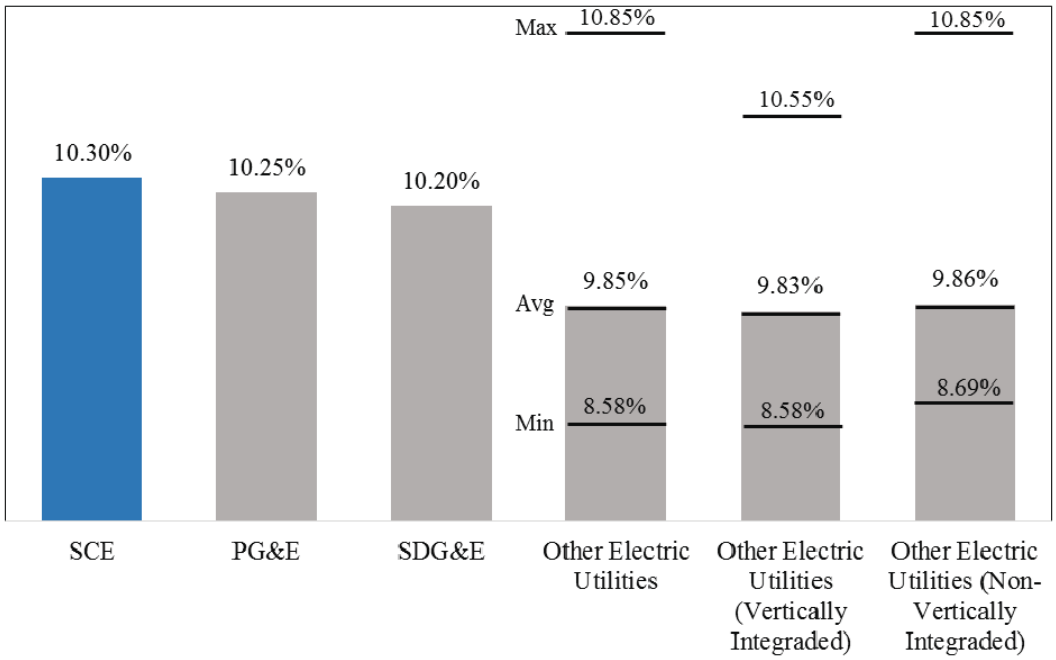
6. How does the utility's authorized ROE compare to the authorized ROE of other utilities nationally, to other California utilities, and to non-utility benchmarks? Include separate comparisons for vertically integrated and non-vertically integrated utilities.

SCE's currently authorized ROE is 10.30%. In this application, SCE is seeking increasing its Base (non-wildfire related) ROE to 10.60% percent and including a Wildfire Risk ROE of 6.00% that SCE would seek to modify or remove upon a material change in SCE's wildfire cost recovery and liquidity risks due to mitigating regulatory or legislative changes. Please refer to Sections III and IV for a detailed discussion on SCE's ROE request. Figure VIII-27 compares SCE's currently authorized ROE to the California Electric Utilities and the average of Other Electric Utilities group. SCE and the California Electric Utilities group current authorized ROEs were established in 2017 and range from 10.2%-10.3%.[188]

[187] Long-term debt include portions maturing within 1 year.

[188] D.17-07-005, *Decision Regarding Joint Petition For Modification Of Decisions 12-12-034 and 13-03-015,* p. 7 (July 13, 2017).

Figure VIII-27
Authorized ROE, SCE vs. CA Electric Utilities and Other Electric Utilities



Companies in the Non-Utility Benchmark do not have an authorized ROE. Data was also limited for authorized ROE for companies in the Water and Gas Utilities group. Figure VIII-28 below summarizes estimated average ROEs utilizing two different methodologies as described by Dr. Villadsen in her testimony.[189]

[189] *See* Exhibit SCE-02 (Testimony of Dr. Villadsen).

Figure VIII-28
ROE Average for Water and Gas Utilities and Non-Utility Benchmark

Methodology	Water & Gas	Non-Utility
CAPM models	9.7% - 11.4%	14.2% - 17.7%
DCF models	8.0% - 11.8%	12.1% - 19.8%

7. What, if any, regulatory, tax, policy, legal, technological, or accounting changes since the test year 2013 Cost of Capital applications have occurred that impact the level of risk facing the utility? Provide a qualitative discussion of the impacts of these changes, and support that discussion with quantitative analysis and data to the extent practicable. Please include changes in any relevant jurisdiction.

There have been several changes that have increased the level of risk facing SCE since the test year 2013 Cost of Capital case. As discussed in Section III, SCE faces many additional regulatory and legislative risks that are not faced by most of the other electric utilities in the United States because it is located in California. These risks have not abated since SCE's last Cost of Capital case and, in fact, have grown increasingly complex. In Exhibit SCE-02, Dr. Villadsen provides quantitative support for the impact of these comparatively-high risks on SCE's Base ROE.

SCE is also exposed to much greater wildfire cost recovery risk. As discussed in Section V.B, rating agencies have specifically discussed these risks as the main reason for downgrading SCE's and EIX's ratings to just above minimum investment grade levels. Brattle developed a quantitative analysis addressing the incremental ROE needed to compensate investors for wildfire risks. Please refer to Section IV and in Exhibit SCE-03 for detailed discussion.

As Dr. Villadsen testifies in Exhibit SCE-02, the Tax Cuts and Jobs Act ("TCJA") enacted in 2017 is another significant change since 2013. The TCJA reduced the federal corporate marginal tax rate from 35% to 21%, thus reducing revenue requirement and operating cash flows for utilities, since most of the benefits of the tax rate reduction flow to customers. The TCJA will likely increase the risk utilities face. Following the passing of TCJA, Moody's downgraded the rating outlooks

for 24 regulated utilities in the U.S. on January 19, 2018 citing "the incremental cash flow shortfall caused by tax reform on projected financial metrics that were already weak, or were expected to become weak, given the existing rating for those companies."[190] Moody's added "[t]he negative outlook also considers the uncertainty over the timing of any regulatory actions or other changes to corporate finance polices made to offset the financial impact."[191] Companies outside of this group of 24 utilities, including SCE, are seen as having a sufficient cash-flow to support their current ratings. Moody's does note that they will continue to monitor the financial impact of tax reform on each company, and further action could occur on a company-by-company basis. Please refer to Exhibit SCE-02, for a detailed discussion on risks related to TCJA.

8. What additional types of information or comparisons should inform the Commission's consideration of cost of capital?

a) Capital Market Conditions

As described in Section III, SCE engaged Dr. Villadsen to conduct modeling and analyses to determine a reasonable Base ROE for SCE. As part of this work, Dr. Villadsen analyzed the impact of capital market conditions on Base ROE. The analysis includes a discussion of recent developments regarding interest rates, evaluation of market risk premium and yield spreads, and an analysis of stock market volatility. Please refer to Exhibit SCE-02 for a detailed discussion of capital market conditions and its impacts on cost of capital.

b) Credit Ratings and Investor Feedback

Bondholders views are impacted by the credit ratings established for the issuer by the credit rating agencies. Cost of debt increases and access to debt capital becomes more difficult as ratings decline, with the greatest impact occurring as credit ratings drop below investment grade.

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190 *Rating Action: Moody's Changes Outlooks on 25 US Regulated Utilities Primarily Impacted by Tax Reform*, Moody's Investors Service, (January 19, 2018), available at: https://www.moodys.com/research/Moodys-changes-outlooks-on-25-US-regulated-utilities-primarily-impacted--PR_378086.

191 *Id.*

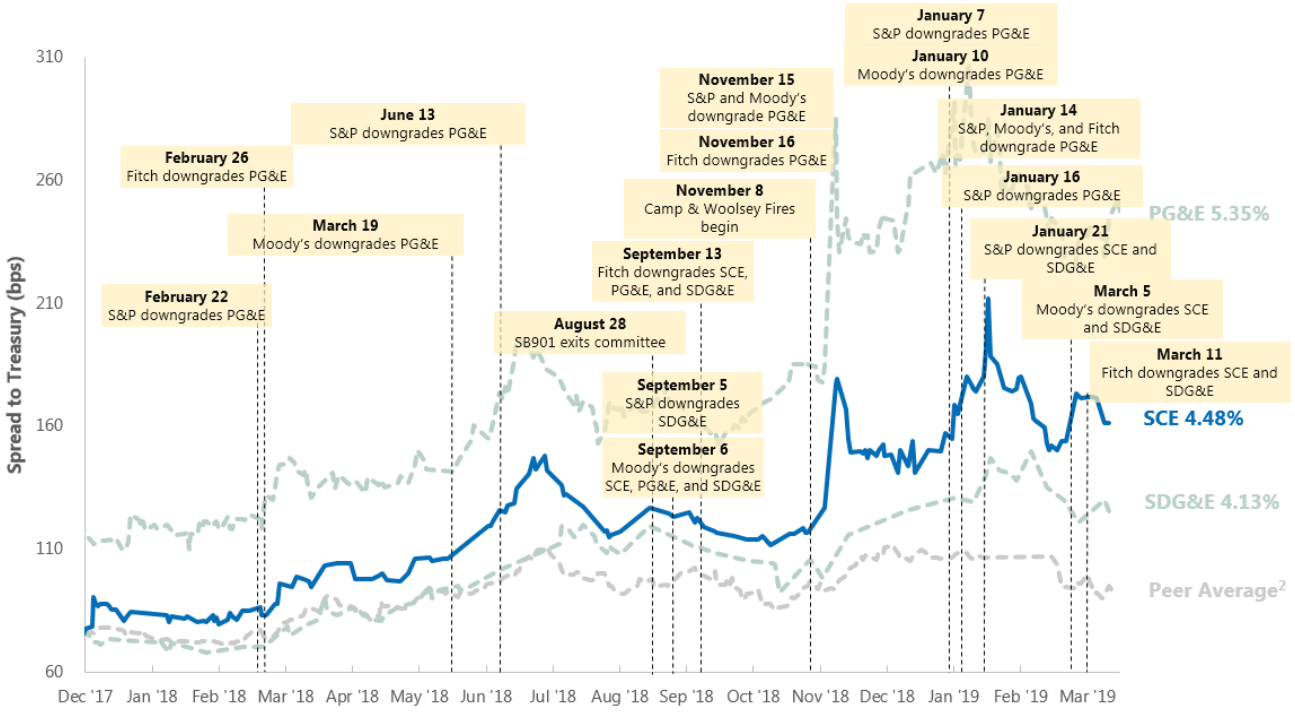
The Commission has recognized the importance of investment grade credit ratings. In its decision approving settlement agreement that allowed PG&E to exit bankruptcy in 2003, the Commission stated:

> In setting just and reasonable rates, in addition to protecting the consumers, we also must consider the financial health of the public utility. Indeed, we view this commitment to act to facilitate and maintain investment grade credit ratings as essentially doing what we have always done under cost-of-service regulation: provide just and reasonable rates and authorize a reasonable capital structure that maintains the fiscal integrity of the utility. As already discussed, our traditional regulation resulted in high investment grade ratings of our energy utilities.… ***as part of our regulatory responsibilities, that it is in the public interest to restore [the IOU's] investment grade credit ratings.***[192]

As discussed, in Section V, the rating agencies have downgraded SCE's and the California Electric Utilities' credit ratings and outlooks and have cited wildfire risks as the main reason for these actions. Concurrently, SCE has observed significant changes in the interest rates required by bondholders in secondary market trading and its 2018 long-term bond offerings. Figure VIII-29 provides California Electric Utilities bond trading levels. Since the 2017 wildfires and SDG&E WEMA Decision, PG&E and SCE have experienced greater volatility and wider spreads compared to utility peers.

[192] D.03-12-035, pp. 32-33 (emphasis added, internal citation omitted).

Figure VIII-29
California Electric Utilities Debt Trading Levels



Note: Shows issuing company and current yield to maturity
Source: Bloomberg, March 26, 2019
[1] A credit spread is the difference in yield between the utility debt security and the Treasury security with the same maturity
[2] Peer average reflects 5-day moving average of spreads for Duke, FP&L, and XEL bonds issuances

As discussed in Section V, SCE's borrowing costs have increased. In March 2018, a month before the first Moody's negative rating action in the year, SCE issued a 30-year bond at a coupon of 4.125%. In March 2019, SCE issued a 30-year bond at a coupon rate of 4.875%. While the 30-year treasury bond rate decreased by 15 basis points between these two time periods, investors required an increase of 90 basis points above that as compensation for purchasing SCE's debt (i.e. a 90 basis point "spread"). This higher spread will ultimately increase customer costs by approximately $200 million over the life of the bonds issued in March of 2019. Given SCE's extensive capital investment program and its ongoing need for new external financing, continued regulatory support for SCE's credit quality is critical to maintaining low capital costs and minimizing the rate impacts of these capital investments.

Besides the impacts on the cost of long-term debt, SCE's commercial paper costs have increased by more than 45 basis points. SCE commercial paper is a key source of funding of SCE's day-to-day operations. This source of funding is highly-dependent on SCE's investment grade credit rating. If SCE is downgraded below investment grade, SCE may no longer be able to issue commercial paper, increasing the cost to customers from short-term financing.

Credit rating agencies such as S&P and Moody's analyze company credit risk from the perspective of bondholders. A recent Morgan Stanley survey of 40 equity investors provides an equity investor perspective.[193] The survey results show that 90% of the investors viewed the CPUC setting the customer harm methodology pursuant to SB 901 as important to determine whether California utilities are investable. As of the survey's issuance, 88% of investors viewed PG&E as uninvestable even if the customer harm threshold applies to 2018 wildfires;[194] 43% of investors viewed SCE as uninvestable if the customer harm threshold applies to 2017 and 2018; and 23% of investors viewed SDG&E's holding company, Sempra Energy, similarly.[195] In the case of SDG&E, a significant number of investors view Sempra Energy as uninvestable despite the fact that SDG&E is a minority component of Sempra Energy's portfolio, which includes significant operations outside of California. Meanwhile, all respondents indicated that investments in PG&E and SCE would require a higher-than-peer cost of capital, and over 50% indicated the same for SDG&E.[196] The survey indicates a need to address more than just the historical customer harm threshold.

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[193] Morgan Stanley Research, PG&E Corp, "Assessing Restructuring Scenarios, Given Recent Headlines" (January 7, 2019).

[194] The CPUC has recently indicated that application of the customer harm threshold beyond 2017 would require legislative action. *See* R.19-01-006, *Assigned Commissioner's Scoping Memo and Ruling,* p. 6 ("Consistent with Pub. Util Code § 451.2(a), the determination of what costs and expenses are just and reasonable must be made in the context of an application for the recovery of specific costs related to the 2017 wildfires. To the extent the Legislature would like the methodology adopted in this proceeding to apply to fires, which ignited in years other than 2017, it may provide that instruction in legislation.").

[195] Based on question 3 of Morgan Stanley Research's survey as shown in exhibit 5 of Morgan Stanley Research's report on PG&E Corp as published, *supra* note 193.

[196] *Id.*

Investors are looking for greater clarity on the framework for cost recovery. Currently, investors believe there is significant risk of disallowance even when an utility operates according to regulations and approved plans. In fact, equity market prices have reflected investor expectations of non-recovery for fires before any facts are known linking a utility to a wildfire. This perception of cost recovery risk is not typical of other jurisdictions and has already resulted in investors targeting a higher return on capital. This investor sentiment is captured by Value Line in a report:

> Investors remain concerned about the wildfire-related liabilities of Edison International's utility subsidiary [SCE]. ... Under California's inverse condemnation law, utilities may be held liable for damage if their equipment contributed to the fires, even if the companies followed established safety and inspection procedures. This makes this situation even more problematic for SCE. ***And there is no assurance that the California Public Utilities Commission (CPUC) will allow the utility to pass all of these costs through to its customers. ... We advise investors to avoid this stock***[197]

While SCE continues to have access to debt and equity capital markets today, S&P, Moody's, and Morgan Stanley have noted that investors do not have confidence in the Commission's cost recovery framework for wildfire risk and are seeking clarification on predictable and reasonable standards of behavior for cost recovery and an acceleration of the determination. Investors are still evaluating the actions of the Commission and State legislature to determine whether the regulatory construct will be supportive of continued capital investments in the State's utilities. By establishing a clear and durable cost recovery framework, the CPUC can help restore investor confidence, and customers will pay a lower net present value of rates as the cost of equity reverts to normal levels. But patience is waning, and the situation can further deteriorate dramatically; therefore, the Commission must address the cost recovery risk as soon as possible and before capital market access ceases altogether and causes significant and potentially long-term harm to the utilities' financial health.

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[197] Value Line Investment Survey (dated January 25, 2019) (emphasis added). This is only available by subscription, but many public libraries subscribe to it, including Los Angeles Public Library, Sacramento Public Library (multiple locations), San Diego Public Library (multiple locations), and San Francisco Public Library (multiple locations).

IX.

CONCLUSION

The Commission should grant a cost of capital that allows SCE to attract the capital that it needs to maintain and expand its business on a long-term basis, and must address the wildfire cost recovery and liquidity risk. Specifically, SCE respectfully requests that the Commission:

1. Find reasonable and authorize SCE's capital structure for 2020 of 52% common equity, 43% long-term debt, and 5% preferred equity;
2. Find reasonable and authorize ROE of 16.60, including a Base ROE of 10.60% for 2020, as well as an additional Wildfire Risk ROE of 6.00% that SCE would seek to modify or remove upon a material change in SCE's wildfire cost recovery risk due to mitigating regulatory or legislative changes;
3. Find reasonable and authorize an embedded cost of debt of 4.74% for 2020, and an embedded cost of preferred equity of 5.70% for 2020;
4. Based on the preceding capital structure and cost factors, find reasonable and authorize a weighted average return on utility rate base of 10.96% for 2020; and
5. Authorize the partial reset of SCE's current cost of capital mechanism or CCM for Base ROE but not Wildfire Risk ROE.

SCE's requests in this application are reasonable, and they are amply supported by SCE's testimony. In order to have a compensatory rate of return on invested capital and have the ability to raise additional capital from investors and generate sufficient equity capital internally to make investments, SCE must be accorded a reasonable authorized cost of capital and ratemaking capital structure. The Commission should grant the cost of capital that SCE has requested.

Appendix A

SCE's Credit Ratings and Ratings Agency Scales

Appendix A
SCE's Credit Ratings and Ratings Agency Scales

	Rating Description	S&P		Moody's		Fitch		
		Long-Term	Short-Term	Long-Term	Short-Term	Long-Term	Short-Term	
Investment Grade -->	Highest quality/ Lowest credit risk	AAA	A-1+	Aaa	P-1	AAA	F1+	
	High quality/ Very low credit risk	AA+		Aa1		AA+		
		AA		Aa2		AA		
		AA–		Aa3		AA–		
	Upper-medium grade/ Low credit risk	A+	A-1	A1		A+		F1
		A		A2		A		
	Medium-grade/ Moderate credit risk	**A– *(FMBs)***	**A-2**	**A3 *(FMBs)***	**P-2**	A-	F2	
		BBB+		Baa1		**BBB+ *(FMBs)***		
		BBB *(Corp. & Unsec.)*		**Baa2 *(Corp. & Unsec.)***	P-3	BBB ***(Unsec.)***		
		BBB–	A-3	Baa3		**BBB– (Corp.)**	**F3**	
<-- Non-Investment Grade	*Speculative/ Elevated credit risk*	***BB+ (Pref)***	*B*	***Ba1 (Pref)***	*NP (Not Prime)*	***BB+ (Pref)***	*B*	
		BB		*Ba2*		*BB*		
		BB–		*Ba3*		*BB–*		
	Highly speculative/ High credit risk	*B+*		*B1*		*B+*		
		B		*B2*		*B*		
		B–		*B3*		*B–*		
	Substantial credit risk/ Vulnerable	*CCC+*	*C*	*Caa1*		*CCC+*	*C*	
		CCC		*Caa2*		*CCC*		
		CCC-		*Caa3*		*CCC-*		
	Very high credit risk/ Highly vulnerable	*CC*		*Ca*		*CC*		
	Default imminent	*C*				*C*		
	Under regulatory supervision	*R*	*R*					
	Selective default/ Restricted default	*SD*	*SD*			*RD*	*RD*	
	In default	*D*	*D*	*C*		*D*	*D*	

SCE Corporate Rating shown in black

SCE First Mortgage Bond (FMB), Preferred Stock, Senior Unsecured, and Short-Term Debt ratings ***noted in bold***

Appendix B

Projected Embedded Cost of Long-Term Debt And Preferred Equity

Southern California Edison Company
Projected Embedded Cost of Long-Term Debt
(Thousands of Dollars)

Line No.		Principal	Net Premium/ (Discount) and Expense	Net Proceeds	Annual Interest Expense	Annual Amortization Expense	Embedded Cost
1.	February 28, 2019 (Recorded)	12,574,341	(223,338)	12,351,004	561,313	19,738	4.7045%
2.	2019 First Quarter Issue	1,100,000	(10,500)	1,089,500	50,220	400	
3.	2019 Second Quarter Issue	0	0	0	0	0	
4.	2019 Third Quarter Issue	525,000	(2,146)	522,854	26,531	191	
5.	2019 Fourth Quarter Issue	0	0	0	0	0	
6.	(Maturing Issues)	(78,571)		(78,571)	(1,450)		
7.	Ft. Irwin Acquisition Debt Amortization	(59)		(59)	(3)		
8.	Amortization and Adjustments		16,448	16,448	0	0	
9.	December 31, 2019 Forecast	14,120,711	(219,535)	13,901,176	636,611	20,328	4.73%
10.	2020 First Quarter Issue	550,000	(5,246)	544,754	28,552	200	
11.	2020 Second Quarter Issue	0	0	0	0	0	
12.	2020 Third Quarter Issue	0	0	0	0	0	
13.	2020 Fourth Quarter Issue		0	0	0	0	
14.	(Maturing Issues)	(78,571)		(78,571)	(1,450)		
15.	Ft. Irwin Acquisition Debt Amortization	(74)		(74)	(4)		
16.	Amortization and Adjustments		20,328	20,328	0	0	
17.	December 31, 2020 Forecast	14,592,065	(204,452)	14,387,613	663,710	20,528	4.76%
18.	**Average Embedded Cost of Debt for 2020**						**4.74%**

Southern California Edison Company
Projected Embedded Cost of Preferred Equity
(Thousands of Dollars)

Line No.		Face Value	Net Premium / (Discount) and Expense	Net Proceeds	Annual Dividend	Annual Amortization Expense	Embedded Cost
1.	February 28, 2019 (Recorded)	2,245,055	(53,579)	2,191,476	120,929	4,448	5.7211%
2.	2019 First Quarter Issue	0	0	0	0	0	
3.	2019 Second Quarter Issue	0	0	0	0	0	
4.	2019 Third Quarter Issue	0	0	0	0	0	
5.	2019 Fourth Quarter Issue	0	0	0	0	0	
6.	(Maturing Issues)	0		0	0		
7.	Amortization and Adjustments	0	3,706	3,706	0	0	
8.	December 31, 2019 Forecast	2,245,055	(49,873)	2,195,182	120,929	4,448	5.71%
9.	2020 First Quarter Issue	0	0	0	0	0	
10.	2020 Second Quarter Issue	0	0	0	0	0	
11.	2020 Third Quarter Issue	0	0	0	0	0	
12.	2020 Fourth Quarter Issue	0	0	0	0	0	
13.	(Maturing Issues)	(575,000)		(575,000)	(32,896)		
14.	Amortization and Adjustments	0	4,448	4,448	0	0	
15.	December 31, 2020 Forecast	1,670,055	(45,425)	1,624,630	88,033	4,448	5.69%
16.	**Average Embedded Cost of Preferred Equity for 2020**						**5.70%**

Appendix C

Witness Qualifications

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

OF SERGIO P. DEANA

Q. Please state your name and business address for the record.

A. My name is Sergio P. Deana, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Principal Manager of Financial Planning and Regulatory Finance in the Treasurer's Department. My present responsibilities are to oversee financial projections and analyses for internal corporate purposes and regulatory filings.

Q. Briefly describe your educational and professional background.

A. I received a Bachelor of Science degree in Mechanical Engineering from Worcester Polytechnic Institute in 2001, a Master of Science degree in Mechanical Engineering from Rensselaer Polytechnic Institute in 2004, and a Master of Business Administration degree from Northwestern University in 2007. I joined Southern California Edison in 2010 as a Project Manager in the Business Planning and Financial Management team within the Transmission & Distribution business unit. In 2013 I was promoted to Senior Manager within SCE's Treasury Department, overseeing cash and capitalization forecasts in the Financial Planning & Analysis team, and in 2016 I was promoted to my current position of Principal Manager. Prior to joining Southern California Edison, I was an engineer, supervisor and manager in the aerospace and industrial supply industries.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of Exhibit SCE-01, entitled *Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020 and to Partially*

Reset the Annual Cost of Capital Adjustment Mechanism, as identified in the Table of Contents thereto.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

OF JONATHAN RUMBLE

Q. Please state your name and business address for the record.

A. My name is Jonathan Rumble, and my business address is 2244 Walnut Grove Avenue, Rosemead, CA 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the acting Principal Manager of Regulatory Economics in the Treasurers organization.

Q. Briefly describe your educational and professional background.

A. I hold a Masters degree in Business Administration from the University of California – Los Angeles and Bachelors degrees in Economics and Government from Skidmore College – Saratoga Springs, NY. Prior to my current position I was Principal Manager, Modeling, Forecasting and Economic Analysis in the Strategy, Planning and Operational Performance organization responsible for developing and advancing corporate strategic planning efforts around the decarbonization of the California electric system in a reliable and cost-effective manner. I have also served as a senior financial analyst at Edison International where I was responsible for the consolidated 10-year financial forecast for Edison International and subsidiaries. Prior to joining Edison in 2003, I worked for Navigant Consulting, Inc. in New York, NY, where I led teams of financial consultants.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of Exhibit SCE-01, entitled *Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020 and to Partially Reset the Annual Cost of Capital Adjustment Mechanism,* as identified in the Table of Contents thereto.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

OF GARY A STERN

Q. Please state your name and business address for the record.

A. My name is Gary A Stern, and my business address is 8631 Rush Street, Rosemead, CA 91770

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Managing Director of State Regulatory Operations. The responsibilities of this function include determining revenue requirements, filing tariffs and advice letters, rate design, load research, case administration, and both Phase 1 and Phase 2 of SCE's General Rate Case.

Q. Briefly describe your educational and professional background.

A. I received a Bachelor of Arts degree in Mathematics and Economics from the University of California at San Diego in 1979. I completed my Masters degree in Economics at the University of California at San Diego in 1981, and I received a Doctor of Philosophy degree from the Universoty of California at San Diego in 1984. I was hired as an analyst performing econometric studies at Southern California Edison in 1984. From there I progressed into resource planning. I became the manager of Integrated Resource Planning in 1991. In 1995 I became the Manager of Restructuring Strategies. In 1998 I became the Director of Market Monitoring, a position I held until 2006 when my rsponsibilities were expanded to Senior Director of Market Strategy & Resource Planning. In 2013 I became the Senior Direcor of Energy Policy unil I assumed my current position in March of 2018.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of Exhibit SCE-01, entitled *Testimony Supporting Southern California Edison's Application for Authority to*

Establish Its Authorized Cost of Capital for Utility Operations for 2020 and to Partially Reset the Annual Cost of Capital Adjustment Mechanism, as identified in the Table of Contents thereto.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

OF DANIEL S. WOOD

Q. Please state your name and business address for the record.

A. My name is Daniel S. Wood and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am Vice President and Treasurer of the Southern California Edison Company. In this capacity, I am responsible for managing and directing the Treasury functions for the Company which includes corporate financial planning and analysis, capital markets, cash management, regulatory economics, risk management, capital analytics and trust investments.

Q. Briefly describe your educational and professional background.

A. I have a Bachelor's Degree (1996) in Economics from California Polytechnic State University, San Luis Obispo. I also have a Master's Degree (1998) in Business Administration, specializing in Finance, from the Graziadio Business School at Pepperdine University. I joined Southern California Edison Company in 1998 as a Financial Analyst in the Corporate Financial Planning Division. I've held various leadership assignments in the finance organization throughout my 20 year career at both Southern California Edison Company and Edison International. A majority of my career has been spent in the area of corporate financial planning and analysis.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of Exhibit SCE-01, entitled *Testimony Supporting Southern California Edison's Application for Authority to Establish Its Authorized Cost of Capital for Utility Operations for 2020 and to Partially*

Reset the Annual Cost of Capital Adjustment Mechanism, as identified in the Table of Contents thereto.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY

QUALIFICATIONS AND PREPARED TESTIMONY

OF NATALIA WOODWARD

Q. Please state your name and business address for the record.

A. My name is Natalia Woodward, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Director of Corporate Finance, Risk Management and Capital Governance. My responsibilities include managing corporate budgeting, long term financial planning, strategic and risk analyses, capital governance, capital analytics and risk mangement.

Q. Briefly describe your educational and professional background.

A. Prior to my current role, I was the Director of Risk Management at SCE, responsible for the development, implementation and monitoring of the company's risk managment program. Prior to that, I have held a variety of management positions at SCE, Edison Mission Energy and Edison International, including in risk management, financial planning, and corporate finance. Before joining the Edison companies, I held finance positions at Allegheny Energy, Merrill Lynch and Dime Savings Bank. I earned a Masters of Arts in Economics from University of California, Davis and a Bachelor of Science in Mathematics and Economics from the University of California, Los Angeles.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of Exhibit SCE-VIII, entitled Commission's Questions in D.17-.07-005 as identified in the Table of Contents thereto.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.